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THE AUTOMOBILE AND MOTOR REVIEW

WEEKLY

NEW YORK — SATURDAY, SEPTEMBER 27, 1902 — CHICAGO

10 CENTS

BUILT for speed,
and speed alone,
the two new rac-
ing machines made by

Ford-Cooper Racing Machine

Henry Ford and Tom Cooper, of De-
troit, are first-class examples of how an

to apply it; it has few conveniences, no
luxuries and not the slightest indication

Cooper machine, while equipped with the
largest automobile engine yet produced

The reduction pro-
cess has been carried
to such an extent
that the Ford and



HENRY FORD IN HIS 70 HORSE-POWER GASOLINE RACING MACHINE JUST COMPLETED AT DETROIT, MICH.

automobile may be simplified by the
"leaving off" process.

This most recent addition to the ranks
of racing monsters has power and means

of a frill or decoration. Not even has an
attempt been made to hide the machinery,
for a motor-bonnet is not necessary to
speed, and no other considerations matter.

in this country, and while of greater tread
and wheel base than any other American
racer, is still within the weight limit of
the 2,000-lb. class.

The wheel base is 9 ft. 9 in., and the tread is 5 ft. 2 in. The huge frame is supported by wire wheels, 34 in. in diameter in front and 36 in. in the rear. These run on plain hubs with bronze bearings, and are fitted with detachable tires. The main frame comprises two side bars of white ash, each 1 3/8 in. by 4 in., and lined with 1/8-in. steel plate. Five cross bars complete the frame and three of these are of the same structure as the side bars. The other two, which support the motor, are of channel steel. Each side bar is trussed by a common "hog brace" of solid steel rod, and the frame is laterally braced by a similar truss across the front, connecting the lower ends of the two steering knuckles. There are no springs on the rear axle, the frame resting directly upon it. The front end, however, is supported by the usual half-elliptic springs.

POWER FIRST CONSIDERATION.

The first consideration in the construction of the machine being the production of power and the only other consideration the utilization of it, it is natural that the engine should constitute the largest and most notable element of the car. It has four vertical cylinders of 7-in. bore and stroke, and should deliver, approximately, 70 h.p. The cylinders, heads, and exhaust valve chambers are cast in one piece, with a continuous water jacket. The engine is rectangular in shape, with a rectangular projection at the top for the exhaust valve chambers, there being no attempt to carry the cylindrical form of the cylinders to the outside of the structure. The crank shaft is mounted in rigid bearings, but there is no crank casing.

A four-way fuel pipe, from a simple mixing valve below the motor, leads to the automatic inlet valves on the left side of the motor head. The exhaust valves are on the right side and are within open boxes 3 1/2 in. square. These resemble chutes as they exhaust the consumed gases downward and outward, directly into the open air. The two-to-one shaft for operating the exhaust valves and the sparking cam runs longitudinally across the right side of the cylinder casting and is driven from the motor shaft by a chain of three-spur gears in front of the motor.

From the gear on the cam shaft the pinion which actuates the centrifugal water pump is driven, the pump being mounted at the side of the motor in line with the gear train. The water tank is under the driver's seat and the radiating system is, of course, on the extreme front end of the frame. It comprises a vertical structure of sixty-four brass pipes, 26 in. by 3/4 in., and mounted in water circulating end supports. There are no ribs on the tubes, as Mr. Ford believes them unnecessary unless, perhaps, on extremely long runs.

PROTECTION FROM DUST.

While there is no crank case, the motor

cranks and shaft are protected from the dust by a tin shield hung underneath the motor from two longitudinal side boards, which extend the entire length of the frame. They are within and below the frame side bars, and serve also to form a footboard support between the motor and the driver's seat. The upper half of the motor flywheel is encased in a wooden box, forming a sort of dashboard for the footboard, and upon this box is placed the induction coil. The current is divided, for the four cylinders, by a commutator mounted on the motor head. The battery comprises five storage cells, those now used having been taken from the famous Baker Torpedo. They are carried on the frame at the left of the seat. The gasoline tank is longitudinally disposed on the frame at the left of the motor. There is no covering for the motor, but its plain, square construction, and the rectangular water radiator ahead, give the front end of the machine much the same general outline and appearance as though it had one of the square European pattern bonnets.

TRANSMISSION GEAR.

In the matter of transmission the car is exceedingly simple, in fact, elementary. The flywheel contains a wooden block clutch, by means of which the rear section of the longitudinal main shaft may be locked with the forward section or motor shaft. Not even is there a knuckle joint in the shaft, for the clutch is on a sleeve and rigidly aligned with the motor shaft. Within the driver's foot-box the shaft is divided and a rigid clamp coupling effected, its object being to permit the separate insertion or removal of the two sections of the shaft.

The shaft extends back to the rear axle, where it terminates in a bevel pinion, which engages a bevel gear mounted rigidly on the rear axle. The absence of springs in the rear permits this rigid connection between motor and drive wheel axle. The fact that the machine is for racing only, and that mainly on large tracks and straight-away courses, permits the abandonment of the differential. There is nothing on the rear axle besides the bevel gear and a brake drum.

SPEED REDUCTION OF GEARS.

Only a slight reduction of speed is provided by the bevel gears, which, incidentally are not incased, but protected from dirt by a tin screen underneath, and the body or floor above. The pinion on the transmission shaft has twenty-eight teeth and the axle gear thirty-five, giving a speed ratio of four to five. This reduction requires 707 motor revolutions to the mile. Both Mr. Ford and Mr. Cooper assert that the motor will run above 1,200 revolutions and pull the machine at the resultant rate of speed. The minimum speed, of course, depends on the limit to which the motor can be successfully slowed by spark retarding and throttling.

Recently, on the Grosse Point track, Mr. Ford succeeded in running at about 9 or 10 miles an hour. Thus, while the car has no practical road usefulness, it is possible, if desired or necessary, to run it under its own power to places of racing or speeding.

OPERATING MECHANISM.

The driver's seat is low down and exactly in the center of the frame. The controlling handles are few and within easy reach. The clutch lever is in the center of the foot box, and directly ahead of the driver. At the right of the seat is a small lever controlling the spark lead, and near the left side of the foot box is a foot pedal, which governs the supply of mixture. The brake is operated by a foot pedal near the right side of the foot box. The thumb wheel for turning on and off the gasoline is near the right side of the seat. The steering post is vertical and instead of being equipped with the ordinary wheel, has a cross arm 25 in. long, each end of which has a vertical grip or handle. This extreme leverage is provided because there is no speed reduction between the steering post and knuckle arms, the connection being by plain lever arms and links.

SPEED POSSIBILITIES OF MACHINE.

Great speed possibilities are expected of the machine, and Tom Cooper, especially, anticipates notable slaughter of the short-distance marks. Mr. Ford's machine is now ready for use, and the Cooper car is substantially completed. The first try-out of the Ford car resulted in a mile in 1:08.

Our front page photograph shows Mr. Ford's machine with the owner and builder aboard.

Stages for National Park.

Notwithstanding the action of Secretary Hitchcock, of the Department of the Interior, who, upon the suggestion of the authorities of Yellowstone National Park, recently made a ruling excluding motor vehicles from the roads in the park, President F. Jay Haynes, of the Montana and Yellowstone Park State Co., of Butte, Mont., states that he has contracted for a number of automobile stages to be used next summer on the Short Line route from Montana to the park over the government roads.

"The government authorities were very anxious to find out if we were going to get an automobile service working," said Mr. Haynes, "as they are going to bring their supplies in from the railroad with their own special autos. They will bring supplies to the posts in the park, and as the roads are excellent there will be no difficulty in running them."

There is some talk of organizing an automobile club in Racine, Wis., and it is said that officials of the Wisconsin Wheel Works are at the head of the project. Many machines are owned in Racine.

WINTON'S BULLET BEATS THE MERCEDES SIMPLEX.

CLEVELAND MEETING A SUCCESS.

Details of the Triple Breaking of the Mile-Track Record in the Presence of 10,000 Spectators—Spirited Races and Many Fast—Steam, Gasoline and Electric Contests.

CLEVELAND, O., Sept. 16. (Staff Correspondence.)—Ten thousand people today witnessed the triple breaking of the mile track record by Alexander Winton at the Glenville track. Ten thousand Clevelands clapped and yelled and stamped and gesticulated as the Winton Bullet repeatedly beat the new Mercedes-Simplex, driven by H. S. Harkness, of New York. Ten thousand persons were unanimous in declaring the first annual automobile meet on the big mile oval not only a success, but one of the greatest affairs ever given at this famous speedway.

By Monday night it was certain that the attendance would equal expectations, for all of the reserved seats in the grand stand had been sold. Long before the program began the great stand was overflowing with 5,000 expectant patrons of the show, and the late arrivals poured down into the space along the fence and into the track inclosure. It was a lively crowd and probably by far the largest ever gathered in one spot to witness automobile races.

Only the day itself prevented the assemblage from taking on the brilliancy of combined color, action and size. Sullen though silent clouds kept out the sun, the bright dresses and gay colors in the throng were dimmed, and the pictures on the track robbed of high lights and shadows. There was little prospect of rain and none came; the air was still and not cold, the track was smooth, hard and without speed retarding "cushion."

RACES A SUCCESS.

The races themselves were an equal success, for all were spirited, some close and many fast. They not only demonstrated that automobile racing can draw patronage, but that it can hold patronage for the future. The events, with a couple of exceptions, were run promptly, but the long program consumed the afternoon and the light had failed before the last, an obstacle race, had been completed.

The most interesting events were the five-mile for gasoline vehicles of the 2,000 pounds class, which was won by C. B. Shanks; the 10-mile handicap for winners and seconds of the first four races, which was captured by Rollin White; the 10-mile open, which brought out the Winton Bullet as winner; the Australian pursuit race, also won by Winton, and the 10-mile open handicap, won by Percy Owen.

The most notable performance of the day was the breaking of the 1- and 10-mile track records by Alexander Winton, who lowered both times in the 10-mile open,

placing the 1-mile mark at 1:02 3-4 and the 10-mile at 10:50.

MACHINES IN COMPETITION.

Conspicuous and most interesting to the public among the machines in competition were the following:

The White steamer, of special construction similar to the recently introduced touring car.

The Mercedes-Simplex, brought by H. S. Harkness from New York, and the only dangerous rival of the Bullet.

The Peerless "Yellow Devil," one of the new Peerless models with a racing body.

The Winton "Pup," a special 20-h.p. machine built for the 2,000-pound class, and a cross between a racer and the towing model for next year; having the same engine, transmission, etc., as the latter.

The Baker Electric Torpedo, famous for its peculiar construction, dramatic debut and speed achievements.

The Winton Bullet, Alexander Winton's new 4-cylinder racer and holder of mile track record.

While the meet was given by the Cleveland Automobile Club, it was directly under the management of George Collister and C. B. Shanks, acting as stewards. To their energy in advertising the meet and to the local interest in the Cleveland-made machines, was the large attendance largely due.

The opening event, five miles for gasoline vehicles of 1,000 pounds or under was won by H. S. Moore with an Elmore. The two other starters were J. D. Dickson, Cleveland runabout, and George W. Dunham, American runabout.

Dickson and Dunham took the lead at the start, but were picked up and passed in the back stretch by Moore, who afterward held the first position and gradually drew away. The spaces between the machines widened steadily as the race progressed, and Moore had a wide margin to spare when he finished, with Dickson second and Dunham about an equal distance further back. The time was 11:19 1-4.

FIVE-MILE FOR STEAMERS.

Rollin White, with the White racer, captured the five-mile open for steamers of all weights. This event drew the first excitement from the crowd. After a call back five machines got away in line, with L. E. Hoffman on the new Hoffman and Rollin White leading. These two passed the wire at the first mile evenly and well ahead, but at the second mile the White had the advantage, with John McDonald on a Geneva, second, and Hoffman following. In the third mile the pace slackened, but White and McDonald kept their respective positions. Beginning the fourth White shot ahead, dropping McDonald and lapping W. C. Buckman, Geneva, and F. J. Jontzen, Locomobile, just before starting the final lap. The race was all his own in 9:53 1-2. McDonald came in second, and Hoffman, third.

Race No. 3, five miles for gasoline vehicles under 2,000, and which was won by C. B. Shanks, brought the new Peerless car, two Winton touring cars and the new Winton "Pup" into competition with the Mercedes of H. S. Harkness, of New York. The five starters were L. P. Mooers, Peerless; Percy Owen, Winton; C. B. Shanks, Winton "Pup;" John Farson, Jr., of Chicago, Winton; H. S. Harkness, Mercedes.

On an even start the "Pup" took the lead, with the Mercedes tacked on. These two cleared the Peerless and the two towing cars and broke the race into two sections. Shanks led at the first mile, while Percy Owen and Mooers fought for leadership of the second bunch, with the Chicagoan out of it. Just as the third mile was started the Mercedes drove ahead and gained slowly through the lap, leading by a hundred yards at the beginning of the fourth mile. His gain increased and when given the bell had doubled it. Both had then lapped Farson. Harkness finished first in 6:32 3-4 by about the same lead, while the Mooers-Owen fight for third position was won by a close margin by Owen.

The Mercedes car was allowed to start in this event on the assumption that its weight was within the limit, it not having been weighed previously. A weighing-in afterward, however, developed the fact that it weighed 2,250 pounds, and Mr. Harkness was accordingly disqualified, Shanks being given first, Owen second and Mooers third.

Rollin White, in a special five-mile trip against time, covered the distance in 6:43, with the White car, which had won the steam event, riding at an even rate throughout. This establishes a new American track record for steam machines.

THREE-MILE ELECTRIC.

In the three-mile electric, which was easily won by Walter Baker, a Wavely, driven by W. M. Wright; two Baker runabouts, driven respectively by Walter Baker and C. E. Denzer, and an American driven by C. J. Washburn, glided away smoothly. Messrs. Baker and Wright took and maintained the lead, the former gaining a hundred yards on his companion in the last lap. Denzer was third, far back; while Washburn was three-quarters of a lap to the bad. The time was 5:54 3-4.

J. H. Hartley, on a motor tricycle, endeavored to break the motor cycle record of 1:24 1-2, but was able only to do 1:33.

When Walter Baker appeared with the famous electric "Torpedo"—or, rather, when the Torpedo appeared with Walter Baker—to go an exhibition mile, it was noticeable in addition to the lustrous white, in which the machine is now painted, that since its unfortunate debut on Staten Island it has been fitted with smaller wheels, the present ones being but 36

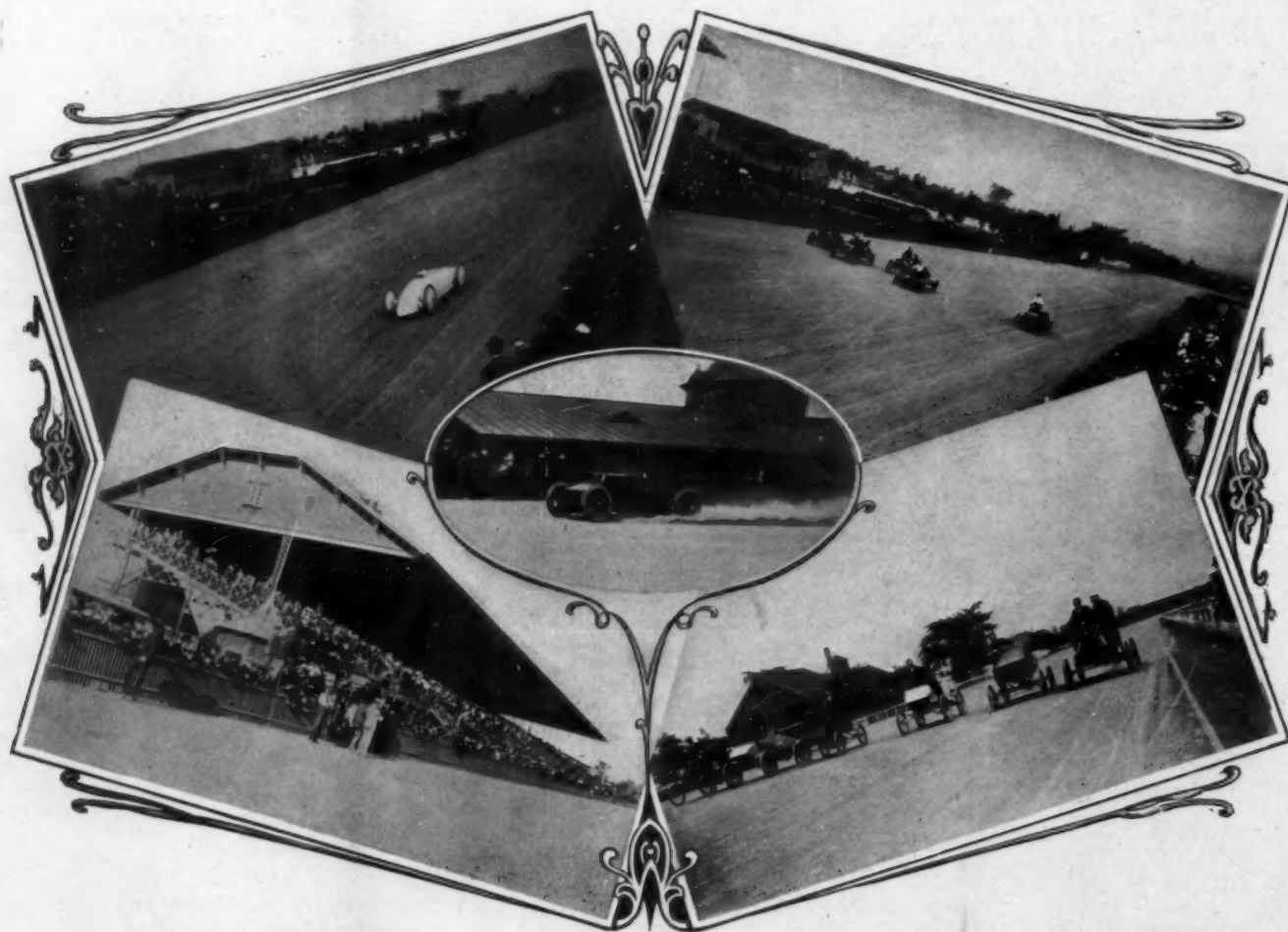
in. in diameter. Mr. Baker did not attempt high speed, appearing merely to show the queer machine to the public. The most clever comment on the event in the neighborhood of the press stand was the remark of a little girl who vainly questioned, "Ma, ma, where's the man?" The time for the mile was 2:07.

Race No. 5 was a 10-mile handicap for the winners and seconds of races Nos. 1, 2, 3, and 4. The following were entitled to start: Rollin White, White; John McDonauld, Geneva; H. S. Moore, Elmore; J. D.

was between Shanks and White. The former got off slowly, and at the fourth mile was an even lap behind White, with Owen between them. Then Shanks went out to gain the distance and for a time it looked as though he might do it. Beginning the last mile the "Pup" was about a quarter of a mile behind White, but with a good chance to catch Owen. Swinging wide on the first turn the right front tire burst and Shanks was compelled to slow down and let Owen keep second place.

Alexander, in an exhibition display of

mile was cut to 1:02 3-4, and the Peerless was lapped in the fourth mile. At the end of the fifth mile his lead over Harkness was 1-2 mile. Winton's time for 5 miles was 5:31 1-3. Harkness caught Moore from behind in the sixth mile and in the seventh mile Winton lapped the Peerless for the second time. In the back stretch on the last lap, Winton caught Harkness, passed him and won by nearly 1 1-8 miles over the Mercedes, and by about 2 1-4 over the little Peerless. Winton's time was 10:50, lowering the previous



Exhibition Mile Baker Torpedo.

Grandstand with Record Crowd.

Winton Speeding in the Bullet.

Five Mile Gasoline Race.

Start Five-Mile Steam Race.

INSTANTANEOUS PHOTOGRAPHS OF EVENTS AND SCENES AT THE CLEVELAND, OHIO, RACE MEETING.

Dickson, Cleveland; Percy Owen, Winton touring car; C. B. Shanks, Winton "Pup"; Walter Baker, Baker runabout; W. M. Wright, Waverley. The starters and handicaps were: Shanks, scratch; Owen, 1 1-2 minute; White, 2 minutes; Wright, 4 minutes; Dickson, 6 minutes. The race was won by Rollin White in 14:59 1-2, with Owen second and Shanks third.

SMALL MACHINES OVERHAULED.

It was a superb race, with the exception that the small machines were not given sufficient start and were consequently easily overhauled by Shanks, White, and Owen, and left to trail. The real race

the much-heralded Bullet, ran a mile in 1:04 1-2, breaking the American track record of 1:06 2-5, made by himself on the Grosse Point tract.

The 25-mile open, won by Winton with the Bullet, was cut to 10 miles owing to the approach of twilight. Only L. P. Mooers, Peerless; Harkness, Mercedes, and Winton, Winton Bullet, started. Winton got away slowly, and Harkness led at the end of the first mile. Passing the grandstand, however, the Bullet dashed around the outside of the turn to the lead and gained an eighth of a mile in the lap. The second mile was made in 1:03, with the lead, of course, increasing. The third

track record of 11:09, made by himself in an ordinary racing machine.

AUSTRALIAN PURSUIT RACE.

In the Australian pursuit race only Winton and Harkness started, Winton being under the wire and Harkness getting away from the half-mile post. Owing to slow starts by both, Winton did not gain much on the first mile, but at the end of the second had cut the distance between them about one-third. His second mile was made in 1:02 1-4. Winton passed Harkness just as the latter started his fifth mile. No complete time was taken.

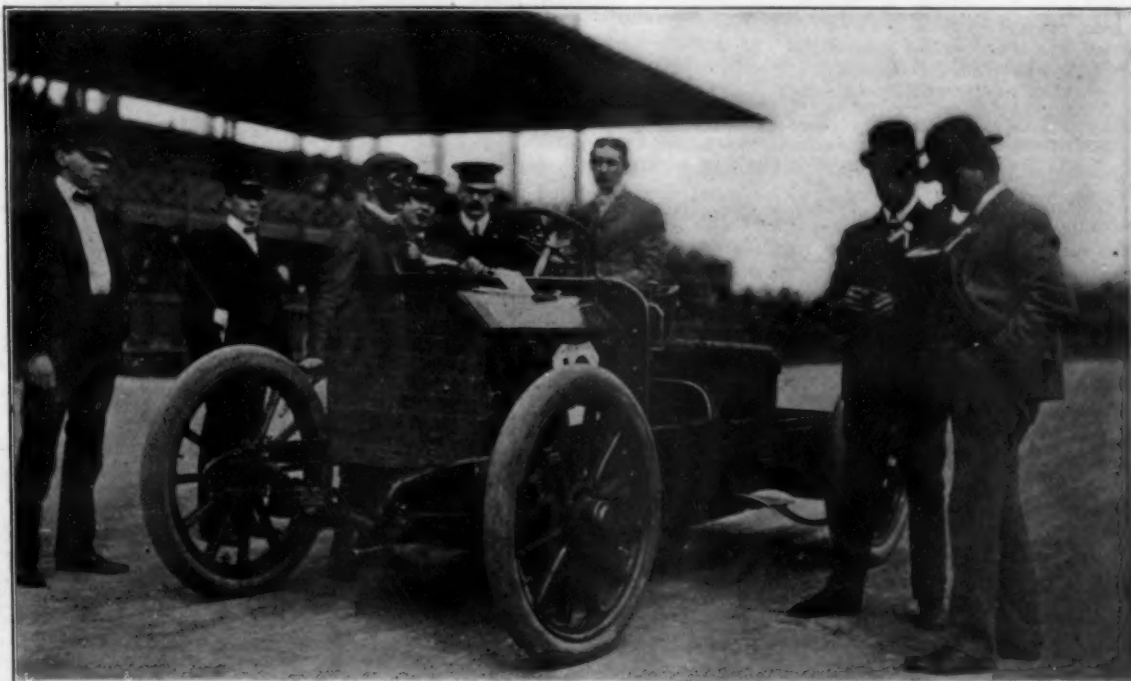
In the 10-mile handicap, the two heats were combined on account of the lateness

of the hour. The starters and handicaps were as follows:

Harkness, scratch; Shanks, 1:30; White, 2:30; Percy Owen, 3:30; L. P. Mooers,

until in the seventh mile, when Owen passed him. White was at this time a strong third and in the ninth mile jumped to second place behind Owen. The finish-

them. The winner's time was 13:34. Harkness, from scratch, negotiated the distance in 11:12. The following times by miles show his excellent run: 1:20, 2:38,



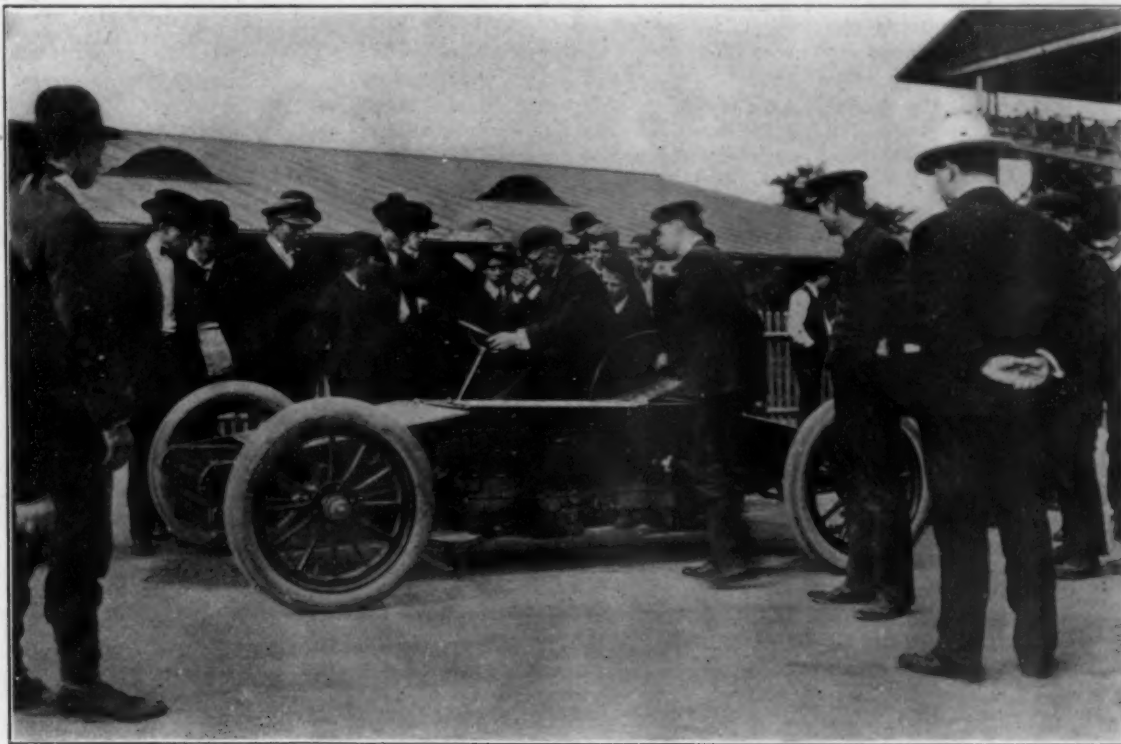
H. S. HARKNESS IN HIS MERCEDES-SIMPLEX, AT THE CLEVELAND MEETING

3:30; John Farson, Jr., 4:00; Paul Rainey, Panhard, 4:30. With such long intervals between the contestants it was a shake-up

ing order was Owen, White, Rainey, Mooers, Shanks, Harkness and Farson. The two back markers, although making

3:48 1-2, 5:00, 6:10 1-2, 7:21 1-2, 8:32 1-2, 9:44, 10:55 1-2, 11:12.

The obstacle race in which several of the



THE WINTON "PUP," WITH C. B. SHANKS AT THE WHEEL.

in the growing dusk for the first 3 miles. After the fourth mile, Rainey, with his 12-h.p. French machine was leading well

splendid runs, were never able to get within reach of any but the Chicago boy, the long starts proving too much for

lighter machines of all classes competed, was run around barrels, etc., in the dark. The summaries were published last week.

BRITISH RELIABILITY TRIALS COVERING FULLY 650 MILES.

RUNNING AND BRAKING TESTS.

Results of the Annual Trials of the Automobile Club of Great Britain and Ireland—Daily Runs of Nearly a Hundred Cars from London as a Center; Records of Times, Stops and General Performance.

LONDON, Sept. 13. (Staff Correspondence.)—Though the annual reliability trials have been under way for a fortnight it is only at this time that any tabulated results have been accessible, and even now the full awards are not complete. The following tables, however, include the most important data of this valuable test. The main feature was the six-days' run of the cars, eighty-eight in number, from the Crystal Palace in London as a center; the long procession starting out each morning for a run over certain definite routes in Surrey, Sussex and Kent. Every car carried an observer and was under the official eye of the committee at all times from the first arrival and inspection at the Crystal Palace on Friday, August 29, to the end of the last day's run on September 6.

The contest was under the direction of a committee composed of nine members of the Automobile Club of Great Britain and Ireland, and an equal number of representatives of the makers. On August 30 a hill test of brakes, ascending and descending, took place; on September 5 there was another trial of hill-climbing and braking. Coincident with the trials was a tire test, which was to be continued until 3,000 miles had been run. One notable feature of the present trials is the classification, neither by weight nor power, but by the selling prices of the cars.

A SLOW SPEED RACE.

In no sort of way whatever did it approach a speed test, indeed, the crawling which had from time to time to be put in rather told against the cars than otherwise in the provocation of overheated engines and clutches. Pumps were not run fast enough to be of real service, while the continual popping in and out and slipping of the clutch, necessary upon the crawl, played the mischief in that direction.

In and out running, that is to say, traveling at high speed on one part of the stage and crawling the other, could be avoided when the car driver was accompanied by a smart and intelligent observer, anxious to do his best for his vehicle, who would keep the driver advised mile stone by mile stone, exactly how he was running. This, also, was work too troublesome or too subtle for the large majority of these honorary workers, so that in the later sections of allotted stages we were treated to the sorry sight of a long line of crawling cars, smoking and clinking their funeral way into some

town or village. The spectacle was not impressive from a spectator's point of view, and to the majority of the onlookers, who could not for the life of them fathom the mystery, and thought all the vehicles suddenly struck by a fit of the slows, automobilism was not thereby upraised in their opinion.

THE CHOICE OF OBSERVERS.

The selection of observers had been left to the trade, that is to say, every entrant of a vehicle was obliged to nominate six observers, or one observer who would act on six days, but who were then appointed to officiate upon other entrants' cars and never by any manner of means upon the vehicles of those who nominated them. Some of the manufacturers appear to have been more than hard put to it to make up their tally of observers, and sent along men who by no means should have been put on such responsible work.

In some cases the imbrolios and bickerings have been serious, in others ludicrous; for instance, a youth of sixteen one day appointed to the 15 h.p. Panhard driven throughout by Charles Jarrott, the winner of the Circuit des Ardennes, took upon himself to instruct the great crack in the art of conducting a 15-h.p. Napier in safety at a maximum speed of 17 1-2 miles. Think of the cheek of it. But it amused Jarrott consumedly, and he gravely allowed himself to be instructed by the youngster, explaining that he really knew little or nothing about these things and that only by the kind and expert advice of such generous observers did he—Jarrott—hope to come through this terrible ordeal alive. Think of it, the man who over frightfully greasy roads and through blinding rain, raced up to acute angled, outward sloping corners, and death, at over 70 miles per hour, to be taken in hand by a callow youth, whose widest experience had never traveled beyond a thumping, slow running, horizontal old Benz. I am told that the son of a well-known London chauffeur, who occupied the tonneau of Jarrott's car upon this occasion is now under medical treatment for the effects of much suppressed laughter through a long day.

GENERAL RESULTS.

The routes selected for these trials and the condition of the roads consequent upon the weather, rendered the tests altogether sufficiently trying, as the table of lost marks showed. Still as one covered the course, now in front of the procession, now behind, and from time to time running backward and forward through it, the contrast with all previous trials was most marked. A car halted by the roadside for anything but tire trouble was a most unusual sight. Out of the sixty-two cars that started in these trials fifty-five completed them in their entirety, six only breaking down, and one vehicle suffering disqualification. This is a better

percentage than ever achieved before, and demonstrates, if anything can demonstrate to the public at large, that the automobile is no longer an uncertain plaything, but a thoroughly practical and reliable vehicle.

THE AMERICAN ENTRIES.

Of all the vehicles running in the trials, the only cars manufactured on your side were four Locomobiles of 5 1-2 h.p. each, and two 6-h.p. White steam cars, one of the latter being driven by W. C. White himself. To this gentleman and his car, and the 20-h.p. Wolseley (gasoline car) belong the honors of making the full total of 300 marks each for each day's run. The Locomobiles did exceedingly well, on the whole, when it is remembered that the time consumed by their water stops lost them a mark for every minute so expended. As can be seen by reference to and comparison of the following tables, the Locomobiles did as well, if not better, on the whole, than the French-built Serpollets.

THE BRAKE CONTESTS.

In addition to the marks obtained on the load, I am able now to inclose you the marks deducted from the condition total of 500 and the 250 total for brakes, which are only just out. The cars were carefully examined by the judges' committee after the conclusion of the trials and marks deducted in accordance with the condition exhibited.

Owing to the large number of the test vehicles which did not hold upon their side or hand brakes, these being the brakes which are applied by side hand lever to drums, either on road driving wheel spokes or sprockets, or live axles, an explanation would appear necessary. In nine cases out of ten the fact of the side brakes not holding was due to two causes. First, the average driver uses his side brakes very seldom indeed, and secondly, upon the present occasion, in oiling up, lubricant had been allowed to drop upon the drums, while the brakes were not as closely adjusted as might be. Many of the cars which failed returned later with properly adjusted and cleaned brakes and held upon the spot perfectly. The modus operandi was as follows: The Hon. Marshal S. F. Edge stood upon a steep pitch—a gradient of 1 in 6.5—and the vehicles approaching slowly from above were requested to hold still at the point indicated by him, first with both brakes, then with the foot brake, and after with the side brakes.

DEFECTIVE SIDE BRAKES.

It was very curious and, indeed, astonishing, to see so many of the cars glide slowly off when the foot brake was released for the trial of the side brakes. Motorists have always felt so much faith and placed so much reliance in their hand lever—applied back-wheel brakes—that their weakness compared to the pedal-applied band brake on the counter-shaft of chain-driven, on the propeller shaft or dit-

ferential gear box of propeller shaft-driven cars proved a bit of an eye-opener even for the cognoscenti.

The holding backward down hill trials were extremely satisfactory, as demonstrating that much greater attention is now paid to this particularly vital feature by manufacturers all round.

Baron Henri de Rothschild, who is building the new Pascal cars on a charitable basis, that is to say, he is finding the capital and handing over all profits made to the Pascal Institute of Paris, rode in the 20-h.p. canopy Pascal throughout the trials, and I am bound to say seemed very much bored at the whole proceedings as he, accustomed to the fierce showing of high-speed contests on the Continent, well might be.

CAUSES OF FAILURES.

In reviewing the cause of failures, renewals for which cars lost marks, it will be noticed that many of these were very trivial and such as the majority of practiced automobilists would have put right upon the road without accounting it anything. Replacing induction valves and spring, exhaust valves and springs, sparking plugs, broken wires, blowing joints, trembler springs, cotter pins to valve stems, are all replacements one takes in a day's run and accounts as a natural part of the proceedings.

We shall be anxious over here to see how your 500 miles trials come off, as compared to ours, but I should like to put it on record here that the committee of examining judges have put the competing vehicles through the strictest possible examination. They have, metaphorically, been turned inside out, and no defect, however small, has been passed over.

The tire trials are still proceeding and will proceed until the end of this month. Partial reports have been issued, but I hold it something useless to give anything but the final results. Only one set of American tires are included, viz., a set of Goodyear tires running on a 10-h.p. Wolseley, which during the first week, the week of the car trials, had not experienced the best of luck.

On this and the three following pages the tabulated results of the trials will be found.

Two New Books.

"Gas, Gasoline and Oil Engines" and "Horseless Vehicles, Automobiles and Motor Cycles" are the titles of two new books by Gardner D. Hiscox, M.E., that have just been published by Norman W. Henley & Co., 132 Nassau St., New York. The former is an octavo volume of 369 pages with 270 illustrations and text written for the general information of everyone interested in the internal combustion motor. The latter is an octavo volume containing 460 pages and 316 illustrations, designed as a treatise for motorists, manufacturers, capitalists, investors, promoters and others interested in motor vehicles.

CONDITION OF CARS AT END OF BRITISH RELIABILITY TRIALS.

Maximum marks 500; deductions as below.

| | |
|--|-----|
| 1-3-h.p. Humber BI, 10 faulty brakes, 20 replacing accumulators..... | 430 |
| 2-2-h.p. Humber BI, 125 faulty brakes, 50 condition of gear..... | 325 |
| 4-5-h.p. Century Tandem, changed igniter battery, no deductions..... | 500 |
| 5-5-h.p. Baby Peugeot, 50 transmission, 25 starting apparatus..... | 425 |
| 7-13-4-h.p. Ormonde M. BI, 100 gudgeon pin dropped out, 75 brakes dangerous..... | 335 |
| 9-5 1-2-h.p. Locomobile, 100 new brake band required..... | 00 |
| 10-5 1-2-h.p. Locomobile, 50 defective brake..... | 450 |
| 19-7-h.p. Star, 100 condition of motor, 50 condition of brakes, 50 transmission..... | 300 |
| 20-5 1-2-h.p. Locomobile, 50 brakes, 100 general condition..... | 350 |
| 21-5 1-2-h.p. Locomobile, 50 brakes, 10 general condition..... | 440 |
| 22-4 1-2-h.p. Renault, 15 new trembler spring..... | 485 |
| 23-8-h.p. M. M. C., no deductions..... | 500 |
| 24-6-h.p. De Dion, 35 condition of tank, 25 new water pipe to tank..... | 440 |
| 26-6-h.p. White Steam Car, no deductions..... | 500 |
| 29-6-h.p. White Steam Car, no deductions..... | 500 |
| 30-10-h.p. Decauville, 25 brakes, 35 engine..... | 440 |
| 32-9-h.p. James & Browne, 25 governor, 10 exhaust valves unprotected from mud..... | 365 |
| 33-12-h.p. Gladiator, no deductions..... | 500 |
| 35-10-h.p. Brooke, 10 condition of clutch..... | 490 |
| 36-8-h.p. Simms, replaced both couplings on driving shaft from gear box to rear axle..... | ? |
| 38-10-h.p. Star, new induction valve and spring sprocket wheel smashed..... | ? |
| 39-10-h.p. Wolseley, 5 one cylinder working only when started..... | 495 |
| 40-7 1-2-h.p. Wolseley, no deductions..... | 500 |
| 41-10-h.p. Wolseley, no deductions..... | 500 |
| 42-12-h.p. Belsize, new inlet valve..... | ? |
| 44-9-h.p. New Orleans, 5 one brake not working..... | 495 |
| 47-8-h.p. De Dion, no deductions..... | 500 |
| 48-8-h.p. Clement, 25 condition of engine, 50 new gasoline tank..... | 395 |
| 51-12-h.p. Gladiator, no deductions..... | 500 |
| 52-10-h.p. Ariel, 20 gear wheel cut, new accumulators..... | 480 |
| 54-12-h.p. Century, cotter pin to inlet valve, stripped key on gear..... | ? |
| 57-10-h.p. M. M. Co., 25 condition of engine, 50 condition of gear..... | 425 |
| 59-7 1-2-h.p. Germain, no return..... | ? |
| 62-6-h.p. Gardner-Serpollet, 50 hand brake, 5 leak in throttle jet..... | 445 |
| 63-6-h.p. Gardner-Serpollet, 50 brake..... | 450 |
| 64-10-h.p. Peugeot, no return..... | ? |
| 65-12-h.p. Brush, 10 brakes, 5 nut on steering pillar, 30 new coil..... | 455 |
| 66-12-h.p. Humber, 40 suction pipe in bad place, full of water from washing car, 10 hand brake, 10 broken water pipe..... | 480 |
| 69-20-h.p. Wolseley, 10 brake, 5 screws on hub caps..... | 485 |
| 71-8-h.p. Wilson & Pilcher, 25 brakes..... | 475 |
| 74-15-h.p. Germain, 50 both brakes, 20 water system leaking, 15 condition of engine..... | 315 |
| 75-16-h.p. Clement, 75 condition of front axle bearings, 250 wheels cut to make room for steering gear, 25 exhaust pipe blows, 10 pump leaks, 20 starting tongue broken off..... | 129 |
| 76-12-h.p. Daimler, 20 engine fires after switch turned off, 50 side wheel brake not holding either way..... | 430 |
| 81-20-h.p. M. M. C., 50 engine firing on only two cylinders, 100 condition of gear, 100 brakes..... | 250 |
| 82-20-h.p. Maudslay, 10 side brake..... | 490 |
| 83-20-h.p. Pascal, 35 brakes, induction valve..... | 485 |
| 84-20-h.p. Pascal, 25 fracture in exhaust, 10 brakes..... | 465 |
| 86-22-h.p. Daimler, no deductions..... | 500 |
| 87-22-h.p. Daimler, 25 brakes..... | 475 |
| 88-15-h.p. Panhard, no deductions..... | 500 |

BRAKE TRIALS. MAXIMUM MARKS 250. DOWNHILL. UPHILL.

| | |
|---|-----|
| 4-5-h.p. Century Tandem, 75 skidded 8 yds., 50 insufficient..... | 125 |
| 5-5-h.p. Baby Peugeot, satisfactory..... | 250 |
| 6-4-h.p. Oldsmobile, satisfactory..... | 250 |
| 9-5 1-2-h.p. Locomobile, satisfactory..... | 250 |
| 10-5 1-2-h.p. Locomobile, 50 insufficient ft. brake, satisfactory..... | 200 |
| 11-4 1-2-h.p. Swift, 50 to use tire brake engine must be cut out of gear, bad design, satisfactory..... | 200 |
| 12-8-h.p. Parr, 50 back brakes insufficient, satisfactory..... | 200 |
| 19-7-h.p. Star, 50 side brakes insufficient..... | 200 |
| 20-5 1-2-h.p. Locomobile, 50 hand brake insufficient, satisfactory..... | 200 |
| 21-6 1-2-h.p. Locomobile, 50 hand brake insufficient, satisfactory..... | 200 |
| 22-4 1-2-h.p. Renault, satisfactory, satisfactory..... | 250 |
| 23-8-h.p. M. M. C., satisfactory, satisfactory..... | 250 |
| 24-6-h.p. De Dion Voiturette, 50 foot brake insufficient, satisfactory..... | 200 |
| 26-6-h.p. White Steam Car, 125 only fitted with one brake..... | 125 |
| 29-6-h.p. White Steam Car, 125 only fitted with one brake, satisfactory..... | 125 |
| 30-10-h.p. Decauville, satisfactory, satisfactory..... | 250 |
| 31-10-h.p. Geo. Richard, not submitted for test..... | 0 |
| 32-9-h.p. James & Browne, 50 back brake insufficient, satisfactory..... | 200 |
| 33-12-h.p. Gladiator, both brakes insufficient..... | 50 |
| 35-10-h.p. Brooke, satisfactory, satisfactory..... | 250 |
| 36-Simms Voiturette, 250 failed to hold on river hill..... | 0 |
| 38-10-h.p. Starr, 50 side brakes insufficient..... | 200 |
| 39-10-h.p. Wolseley, satisfactory, satisfactory..... | 250 |
| 40-7 1-2-h.p. Wolseley, 50 side brakes insufficient..... | 200 |
| 41-10-h.p. Wolseley, 50 side brakes insufficient..... | 200 |
| 42-12-h.p. Belsize, 50 foot brake insufficient downhill..... | 200 |
| 44-9-h.p. New Orleans, 50 side brake insufficient..... | 200 |
| 47-8-h.p. De Dion, satisfactory, satisfactory..... | 250 |
| 48-8-h.p. Clement, satisfactory, satisfactory..... | 250 |
| 51-12-h.p. Gladiator, 200 both brakes insufficient..... | 50 |

(Table Continued on Page 10)

TABULATED RESULTS OF THE BRITISH RELIABILITY TRIALS—VEHICLES CLASSIFIED BY SELLING PRICE.

SECTION I.

The following motor vehicles entered by their manufacturers or by the authorized agents of manufacturers, or by private owners, assembled at the Crystal Palace, London, on Monday, September 1st, and took part in the trials.

CLASS A.—VEHICLES (CYCLES OR CARS) DECLARED AT A SELLING PRICE OF £450 (\$750) OR LESS.

| Official No. | Description of Car. | No. of passengers including driver. | No. of cylinders. | Bore and stroke of cylinder. | b.h.p. | Weight unladen. | Driver. | Marks for each day. | Fuel Consumption on Friday. |
|--------------|------------------------------------|-------------------------------------|-------------------|------------------------------|--------|-----------------|--------------|---------------------|-----------------------------|
| | | | | | | | | 1 2 3 4 5 6 | Qts. Pts. Oza. |
| 1 | 3 h.p. chain-driven Humber bicycle | 1 | 1 | 3in. by 3in. | 3 | 135 lb. | B. Yates | .. .. . | 0 5 6 |
| 2 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 2 1/2 in. by 3 in. | 3 | 125 lb. | C. Clench | .. .. . | 2 1 10 |
| 3 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 3 1/4 in. by 3 1/4 in. | 4 1/2 | 4 cwt. | .. .. . | .. .. . | 5 1 10 |
| 4 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 3 1/4 in. by 3 1/4 in. | 4 1/2 | 6 1/2 cwt. | A. E. Arnold | .. .. . | 6 1 0 |
| 5 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 3 1/4 in. by 3 1/4 in. | 4 1/2 | 6 1/2 cwt. | A. C. Wright | .. .. . | .. .. . |
| 6 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 3 1/4 in. by 3 1/4 in. | 4 1/2 | 6 1/2 cwt. | .. .. . | .. .. . | .. .. . |
| 7 | 2 h.p. chain-driven Humber bicycle | 1 | 1 | 3 1/4 in. by 3 1/4 in. | 4 1/2 | 6 1/2 cwt. | .. .. . | .. .. . | .. .. . |

* Accident with dog. CLASS A.—The marks for motor bicycles will not be published till all the observers' reports are checked.

CLASS B.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £150 (\$750), BUT NOT MORE THAN £200 (\$1,000).

| Official No. | Description of Car. | No. of passengers including driver. | No. of cylinders. | Bore and stroke of cylinder. | b.h.p. | Weight unladen. | Driver. | Marks for each day. | Fuel Consumption on Friday. |
|--------------|-----------------------|-------------------------------------|-------------------|------------------------------|--------|-----------------|--------------|---------------------|-----------------------------|
| | | | | | | | | 1 2 3 4 5 6 | Qts. Pts. Oza. |
| 8 | 4 h.p. Oldsmobile | 2 | 2 | 4 1/4 in. by 6 in. | 4 | 7 cwt. | W. Patcham | .. .. . | .. .. . |
| 9 | 5 1/2 h.p. Locomobile | 2 | 2 | 2 1/4 in. by 3 1/4 in. | 5 1/2 | 6 1/2 cwt. | W. Batchelor | .. .. . | .. .. . |
| 10 | 5 1/2 h.p. Locomobile | 2 | 2 | 2 1/4 in. by 3 1/4 in. | 5 1/2 | 6 1/2 cwt. | R. M. Blake | .. .. . | .. .. . |
| 11 | 4 1/2 h.p. Swift | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 8 1/2 cwt. | A. McCormack | .. .. . | .. .. . |

CLASS C.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £200 (\$1,000), AND NOT MORE THAN £300 (\$1,500).

| Official No. | Description of Car. | No. of passengers including driver. | No. of cylinders. | Bore and stroke of cylinder. | b.h.p. | Weight unladen. | Driver. | Marks for each day. | Fuel Consumption on Friday. |
|--------------|-----------------------|-------------------------------------|-------------------|------------------------------|--------|-----------------|-----------------|---------------------|-----------------------------|
| | | | | | | | | 1 2 3 4 5 6 | Qts. Pts. Oza. |
| 12 | 8 h.p. Part light car | 4 | 4 | 4 1/4 in. by 4 1/4 in. | 8 | 12 cwt. | A. Molde | .. .. . | .. .. . |
| 13 | 7 h.p. Star | 4 | 4 | 3 1/4 in. by 4 1/4 in. | 7 | 14 1/2 cwt. | F. R. Goodwin | .. .. . | .. .. . |
| 14 | 5 1/2 h.p. Locomobile | 2 | 2 | 2 1/4 in. by 3 1/4 in. | 5 1/2 | 6 1/2 cwt. | A. E. Glider | .. .. . | .. .. . |
| 15 | 5 1/2 h.p. Locomobile | 2 | 2 | 2 1/4 in. by 3 1/4 in. | 5 1/2 | 6 1/2 cwt. | R. H. S. Abbott | .. .. . | .. .. . |
| 16 | 4 1/2 h.p. Renault | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 7 1/2 cwt. | L. E. M. Strode | .. .. . | .. .. . |
| 17 | 4 1/2 h.p. Renault | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 7 1/2 cwt. | J. R. Sharpe | .. .. . | .. .. . |
| 18 | 4 1/2 h.p. Renault | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 7 1/2 cwt. | W. Mann | .. .. . | .. .. . |
| 19 | 4 1/2 h.p. Renault | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 7 1/2 cwt. | D. Edmunds | .. .. . | .. .. . |
| 20 | 4 1/2 h.p. Renault | 2 | 2 | 3 1/4 in. by 4 in. | 4 1/2 | 7 1/2 cwt. | W. C. White | .. .. . | .. .. . |

CLASS D.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £300 (\$1,500), AND NOT MORE THAN £400 (\$2,000).

| Official No. | Description of Car. | No. of passengers including driver. | No. of cylinders. | Bore and stroke of cylinder. | b.h.p. | Weight unladen. | Driver. | Marks for each day. | Fuel Consumption on Friday. |
|--------------|-------------------------|-------------------------------------|-------------------|------------------------------|--------|-----------------|------------------|---------------------|-----------------------------|
| | | | | | | | | 1 2 3 4 5 6 | Qts. Pts. Oza. |
| 21 | 10 h.p. Decauville | 4 | 4 | 110mm. by 110mm. | 10 | 14 cwt. | F. W. Slater | .. .. . | .. .. . |
| 22 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | T. W. Browne | .. .. . | .. .. . |
| 23 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | A. E. Permain | .. .. . | .. .. . |
| 24 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | M. Brooke | .. .. . | .. .. . |
| 25 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | S. Rowbottom | .. .. . | .. .. . |
| 26 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | Prue | .. .. . | .. .. . |
| 27 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | H. F. Griffiths | .. .. . | .. .. . |
| 28 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | J. Hadley | .. .. . | .. .. . |
| 29 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | H. Prosser | .. .. . | .. .. . |
| 30 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | J. Owen | .. .. . | .. .. . |
| 31 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | J. W. Stocks | .. .. . | .. .. . |
| 32 | 10 h.p. Georges Richard | 4 | 4 | 100mm. by 100mm. | 10 | 14 cwt. | W. H. M. Burgess | .. .. . | .. .. . |

*Note.—The English hundred weight weighs 112 pounds.

CLASS E.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £400 (\$2,000), AND NOT MORE THAN £500 (\$2,500).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|-------------------------|-------------------------------------|-------------------|------------------------------|--------|-----------------|---------------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 51 | 12 h.p. Gladiator | 4 | 4 | 75mm. by 110mm. | 12 | cwt. | P. Morcy | 196 | 238 | 300 | 249 | 300 | 300 | 12 1 1 |
| 52 | 10 h.p. Ariel | 4 | 2 | 3 1/2 in. by 4 in. | 10 1/2 | 15 | J. D. Spencer | 270 | 252 | 285 | 273 | 300 | 272 | 12 1 4 |
| 53 | 14 h.p. New Orleans | 4 | 4 | 100mm. by 110mm. | 14 | 16 | J. W. Astill | 270 | 300 | 249 | 300 | 300 | 300 | 13 1 0 |
| 54 | 12 h.p. Century | 4 | 2 | 75mm. by 110mm. | 11 | 15 | T. Emerson | 273 | 288 | 6 | 300 | 298 | 300 | 15 0 0 |
| 55 | 10 h.p. New Orleans | 4 | 4 | 100mm. by 110mm. | 13 | 16 | — | 280 | 300 | 249 | 300 | 300 | 300 | 15 0 0 |
| 56 | 10 h.p. M. M. C. | 4 | 2 | 110mm. by 130mm. | 10 | 16 | W. H. White | 280 | 281 | 300 | 284 | 289 | 289 | 16 1 0 |
| 57 | 10 h.p. M. M. C. | 4 | 2 | 110mm. by 130mm. | 10 | 16 | — | 280 | 281 | 300 | 284 | 289 | 289 | 16 1 0 |
| 58 | 7 1/2 h.p. Germain | 4 | 2 | 85mm. by 130mm. | 20 | 17 | — | 297 | 300 | 300 | 300 | 300 | 294 | — |
| 59 | 20 h.p. Georges Richard | 2 | 4 | 100mm. by 100mm. | 20 | 17 | — | bro | own | — | — | — | — | — |

CLASS F.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £500 (\$2,500), AND NOT MORE THAN £600 (\$3,000).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|---------------------------|-------------------------------------|-------------------|------------------------------|------|-----------------|-----------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 62 | 6 h.p. Gardiner-Serpellet | 4 | 4 | 55mm. by 92mm. | 10 | cwt. | W. H. Dew | 300 | 297 | 300 | 298 | 300 | 298 | 13 0 0 |
| 63 | 6 h.p. Gardiner-Serpellet | 4 | 4 | 55mm. by 92mm. | 10 | 18 | — | 301 | 290 | 300 | 300 | 300 | 294 | 13 0 0 |
| 64 | 10 h.p. Peugeot | 4 | 4 | 94mm. by 94mm. | 16 | 19 | C. Dear | 290 | 290 | 300 | 293 | 300 | 300 | 13 0 0 |
| 65 | 12 h.p. Brush | 4 | 4 | 85mm. by 118mm. | 14 | 18 | — | 300 | 292 | 290 | 292 | — | 300 | 13 1 0 |

CLASS G.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £600 (\$3,000), AND NOT MORE THAN £700 (\$3,500).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|---------------------------|-------------------------------------|-------------------|------------------------------|------|-----------------|---------------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 68 | 12 h.p. Humber | 4 | 4 | 3 1/4 in. by 4 in. | 12 | cwt. | H. Belcher | 300 | 294 | 300 | 300 | 300 | 300 | 14 0 12 |
| 69 | 12 h.p. Humber | 4 | 4 | 3 1/2 in. by 4 in. | 12 | 18 | T. Fardon | 300 | 300 | 300 | 300 | 300 | 300 | 24 1 0 |
| 70 | 10 h.p. Wolsey | 4 | 4 | 4 1/2 in. by 5 in. | 21 | 23 | S. Girling | 300 | 300 | 300 | 300 | 300 | 300 | No returns. |
| 71 | 8 h.p. Mors | 4 | 4 | 3 1/4 in. by 4 1/2 in. | 14 | 19 | — | 300 | 300 | 300 | 300 | 300 | 300 | 16 1 2 |
| 72 | 8 h.p. Wilson and Filcher | 4 | 4 | 3 1/2 in. by 3 1/2 in. | 12 | 19 | W. G. Wilson | 300 | 300 | 300 | 300 | 300 | 300 | 16 1 0 |
| 73 | 15 h.p. Germain | 4 | 4 | 90mm. by 130mm. | 20 | 19 | A. Vanderpool | 300 | 297 | 300 | 300 | 300 | 300 | 16 1 0 |
| 74 | 15 h.p. Germain | 4 | 4 | 90mm. by 130mm. | 20 | 19 | — | 300 | 297 | 300 | 300 | 300 | 300 | 16 1 0 |
| 75 | 16 h.p. Clement | 2 | 4 | 3 1/2 in. by 3 1/2 in. | 20 | 13 1/2 | — | 293 | 292 | 179 | 300 | 300 | 296 | 8 0 10 |

CLASS H.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £700 (\$3,500), AND NOT MORE THAN £800 (\$4,000).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|--------------------|-------------------------------------|-------------------|------------------------------|------|-----------------|------------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 76 | 12 h.p. Daimler | 5 | 4 | 85mm. by 100mm. | 14 | cwt. | A. Farnell | 297 | 300 | 276 | 300 | 300 | 293 | 16 0 16 |
| 77 | 12 h.p. Daimler | 4 | 4 | 85mm. by 100mm. | 14 | 16 | E. Lewis | 293 | 300 | 300 | 300 | 300 | 300 | 22 0 10 |
| 81 | 20 h.p. M. M. C. | 4 | 4 | 100mm. by 130mm. | 34 | 15 1/2 | G. Hien | 300 | 300 | 300 | 300 | 300 | 300 | 22 0 10 |

CLASS I.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £800 (\$4,000), AND NOT MORE THAN £1,000 (\$5,000).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|--------------------|-------------------------------------|-------------------|------------------------------|------|-----------------|----------------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 82 | 20 h.p. Mandalay | 4 | 3 | 5 in. by 5 in. | 25 | 23 1/2 cwt. | C. C. Mandalay | 300 | 298 | 300 | 300 | 300 | 300 | 8 1 0 |
| 83 | 20 h.p. Pascal | 4 | 4 | 120mm. by 130mm. | 32 | 900 kilos. | E. T. Stead | 276 | 290 | 293 | 299 | 295 | 291 | 13 1 10 |
| 84 | 20 h.p. Pascal | 4 | 4 | 120mm. by 130mm. | 32 | 900 kilos. | Henri Degraus | 294 | 296 | 300 | 300 | 300 | 300 | 17 0 10 |

CLASS K.—CARS DECLARED AT A SELLING PRICE OF MORE THAN £1,000 (\$5,000), AND NOT MORE THAN £1,200 (\$6,000).

| Official No. | Description of Car | N. of passengers, including driver. | No. of cylinders. | Bore and stroke of cylinder. | h.p. | Weight unladen. | Driver. | Marks for each day. | | | | | | Fuel Consumption on Friday. |
|--------------|--------------------|-------------------------------------|-------------------|------------------------------|------|-----------------|---------------|---------------------|-----|-----|-----|-----|-----|-----------------------------|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 86 | 22 h.p. Daimler | 4 | 4 | 105mm. by 130mm. | 22 | cwt. | — | 300 | 300 | 300 | 300 | 295 | 297 | 8 0 0 |
| 87 | 22 h.p. Daimler | 5 | 4 | 105mm. by 130mm. | 22 | 23 | E. Instone | 300 | 300 | 300 | 300 | 300 | 300 | 24 0 0 |
| 88 | 15 h.p. Panhard | 4 | 4 | 92mm. by 134mm. | 18 | 18 | Chas. Jarrott | 300 | 300 | 299 | 300 | 300 | 300 | 10 1 0 |

*NOTE.—The English hundred-weight weighs 112 pounds.

BRITISH BRAKE TRIALS. MAXIMUM MARKS 250. DOWNHILL. UPHILL

(Continued from Page 7)

| | |
|---|-----|
| 52-10-h.p. Ariel, satisfactory, satisfactory..... | 250 |
| 53-14-h.p. New Orleans, satisfactory, satisfactory..... | 250 |
| 54-12-h.p. Century, 250 failed to hold on Sundridge Hill..... | 0 |
| 56-14-h.p. New Orleans, 50 side brakes inefficient..... | 200 |
| 57-10-h.p. M. M. C., 50 side brakes inefficient..... | 200 |
| 59-7 1-2-h.p. Germain, satisfactory, satisfactory..... | 250 |
| 60-20-h.p. Geo. Richards, not submitted for test, satisfactory..... | 0 |
| 62-6-h.p. Gardner-Serpollet, 50 hand brake insufficient, satisfactory..... | 200 |
| 63-6-h.p. Gardner-Serpollet, 50 hand brake insufficient..... | 200 |
| 64-10-h.p. Peugeot, satisfactory, satisfactory..... | 250 |
| 65-12-h.p. Brush, 50 side brakes insufficient, satisfactory..... | 200 |
| 66-12-h.p. Humber, 50 side brakes insufficient, satisfactory..... | 200 |
| 69-20-h.p. Wolseley, 50 side brakes insufficient, satisfactory..... | 200 |
| 70-10-h.p. Mors, satisfactory, satisfactory..... | 250 |
| 71-8-h.p. Wilson & Plicher, satisfactory, satisfactory..... | 250 |
| 74-15-h.p. Germain, 50 side brakes insufficient, satisfactory..... | 200 |
| 75-16-h.p. Clement, satisfactory, satisfactory..... | 250 |
| 76-12-h.p. Daimler, satisfactory, satisfactory..... | 250 |
| 77-12-h.p. Daimler, 50 side brakes insufficient, satisfactory..... | 200 |
| 81-20-h.p. M. M. C., satisfactory, satisfactory..... | 250 |
| 82-20-h.p. Maudslay, 50 side brakes insufficient, satisfactory..... | 200 |
| 83-20-h.p. Pascal, 50 side brakes insufficient, satisfactory..... | 200 |
| 84-20-h.p. Pascal, satisfactory, satisfactory..... | 250 |
| 86-22-h.p. Daimler, satisfactory, satisfactory..... | 250 |
| 87-22-h.p. Daimler, 50 foot brake insufficient, 50 brakes insufficient..... | 150 |
| 88-15-h.p. Panhard, satisfactory, satisfactory..... | 250 |

IN HILLY KANSAS CITY

Excessive Grades Tax Vehicles Severely, but Streets Are Well Paved—Local Machine Needs.

KANSAS CITY, Mo., Sept. 20. (Special Correspondence.)—When Kansas City had the bicycle fever it used to be said that any man who could ride here could ride anywhere, and this assertion was corroborated by the remarks of tourists returning to town after spending their vacations in the mountains, where, they said, the riding was not much harder than it was in Kansas City. There are, in fact, few level spots in the city, which is one of the hilliest in the country. Some of the grades are slight, perhaps from 3 to 8 per cent., but, after ascending one of these, the next hill may have a grade of 18 per cent. or more. Occasionally it becomes necessary to climb grades of 22 per cent. with the alternative of making a wide detour. For this reason the motor vehicle has yet to become very popular here, and the growth of enthusiasm in motoring appears to be principally dependent upon the production of vehicles of exceptional hill-climbing abilities.

LIGHT, POWERFUL MACHINES WANTED.

Any machine that will not take what is considered a fair grade at good speed is practically useless; four to six miles an hour is not a useful nor particularly pleasant rate of travel. Of course, many of the heavy touring cars with high power would do the required work, but at present, at least, these are not the sort of machines that are sought after here. What is wanted is a comparatively light, compactly built carriage, of moderate horse-power and speed that will climb all ordinary grades on at least the intermediate gear. When the manufacturers offer a machine, at a moderate price, that meets all these requirements, then it may be expected that motoring will become as popular here as it is in other places.

Durability is also an essential. Not a few sales have been prevented by the failure of the machine or its breakdown on a hill during an exhibition ride. The buyer does not want to get stuck on a hill or have the brakes fail on a steep grade, which might result in a serious accident. While such things cannot be absolutely avoided until perfection has been reached, yet they must happen very infrequently if many sales are to be made to local buyers.

ELECTRIC MACHINES UNSUITED TO NEEDS.

Measured by the foregoing requirements, which may perhaps represent the ideal automobile, only a few vehicles have as yet given satisfaction. Electric vehicles are out of the question. They were tried some years ago, but the results did not justify the establishment of an agency here. An electric machine that would travel 50 miles on one charge in a level city like Chicago, could not be counted upon for more than a third of that distance in Kansas City. Two such machines, once owned here, would go no farther than four miles,

De Dion-Bouton, and Winton have stood the test better than the other makes tried. In the steam class, the Locomobile and Foster have done well. Steam has its disadvantage, however, because of the hills, which cause the steam pressure to rise and fall so quickly that a great deal of attention to the gauge is necessary. "Boiler burned out" is such a common expression that it no longer attracts notice. Factory experts have been known to burn out the boilers on the hills. The eye must be riveted almost constantly on the water glass and gauges. Many motorists prefer to give their attention to the scenery.

MOTORETTES FOUND SATISFACTORY.

There is only one Winton here, and it is not handled in a way to give the best results, giving occasional difficulty on the steep grades. The Haynes-Apperson has made a good record, but some of the local buyers object to its weight and also its price. More Pierce motorettes have been bought this year than other makes, and this little machine has shown itself to be one of the best hill climbers and general service machines for Kansas City users. The De Dion-Bouton has also done well.

No complaint is made regarding the street pavements. Last year 20.34 miles of street were paved at a cost of \$722,571.16, making a total paved mileage of 174.59. For a city of not much in excess of 300,000 population, this is an excellent showing. In addition, there are 250 miles



A STIFF GRADE



SNAP SHOTS OF KANSAS CITY MOTORISTS.

although on level roads they had made from 25 to 30 miles without any difficulty.

Even some of the lighter gasoline machines will not do what is expected of them. The Pierce, Haynes-Apperson,

of finely macadamized country roads just outside of the city, which are excellent for touring. Most of the dirt roads, too, are in fair condition for six months of the year.

NEW RIKER GASOLINE CAR.

Plans of the Locomobile Company of America for Building a Gasoline Vehicle.

The prominence of A. L. Riker as a designer and builder of motor vehicles, and the fact that, after much successful work with electric cars, he has for over a year been working on a gasoline car, have given rise to much conjecture as to his future plans. This has, at last, been set at rest by the announcement that he has completed a car which will be built by The Locomobile Company of America. This company, one of the first in the field with a practical steam machine, has heretofore confined itself to the standard power, building more steam carriages than any other maker and selling them in all parts of the world. The developments of

pee Falls; one of the new cars has been run experimentally for a distance of several thousand miles. They will very shortly be shown in New York and one will take part in the A. C. A. reliability contest.

Automobiles in Albany, N. Y.

The Albany Automobile Club, which is the nucleus of the motor vehicle owners in Albany, N. Y., is a flourishing organization. It has fourteen active members. There are as many more unattached owners in Albany and the number is constantly growing. Physicians are adopting motor vehicles for use in visiting their patients and are finding them more satisfactory than the horse as they can stand the hard service over the hills and the rough pavements of the city better than

department, wash room and a bicycle department. The basement is also used for vehicle storage and for the storage of lubricating oils and machine parts. The gasoline is stored outside the building in an underground tank, connected with an inside pump that measures the exact amount of liquid it draws and may be regulated to measure pints, quarts and gallons as desired.

Mr. Stockbridge, who is but 30 years of age, made his start in the automobile line with the Stanley Brothers, original builders of the present type of steam carriages, and later went with the Locomobile Co., which succeeded to the Stanley patents. He went to Paterson two years ago and associated himself with C. E. Beach, who formerly conducted a motor vehicle store on Lower Broadway,



NEW GASOLINE CAR DESIGNED BY L. RIKER FOR THE LOCOMOBILE COMPANY OF AMERICA.

Original photograph by courtesy of the Mail and Express, New York.

the past two years have pointed out the desirability of adding a gasoline car to the company's list, and the result is the car here illustrated.

The car has been designed for American roads, in particular having a liberal amount of clearance between flywheel and axle and the road surface. The four-cylinder motor is of 12 h.p., the wheel base is 6 ft. 10 in., and the tread 5 ft. 1 in. An improved throttle control is fitted, giving great flexibility to the power. The chain transmission is used. All details of control levers, brakes, lubricators, etc., have been planned in the light of the latest improvements to give a perfect road car. This car, with tonneau, will sell at \$5,000, and a smaller one, two-cylinder, 8-h.p., will also be built. The work has thus far been done at the Overman factory, Chico-

the horse. Even liverymen can be seen riding about Albany in their automobiles while their stables are full of horses. All the tourists passing between New York and the New England States and Buffalo and the West have passed through Albany during the season and registered at the local Blue Book station.

Growth of a Paterson, N. J. Station.

One of the largest and best motor vehicle headquarters in New Jersey has just been finished and occupied by Frank W. Stockbridge, in Paterson, on upper Broadway. This new station is a two-story structure, 100 by 25 ft., and has an elevator capable of lifting the largest motor vehicle. The ground floor is used for show rooms, offices and for storage purposes; on the second floor is the repair

and the following year started in business for himself and was joined by his brother, Arthur Stockbridge. He now employs seven experienced mechanics and has a night man who keeps the station open for the accommodation of late customers. Since the opening of the present season Mr. Stockbridge has sold four carloads of Oldsmobiles and sixty other machines, and has ordered two other carloads of Oldsmobiles. He is a member of the North Jersey Automobile Club and is well known in the trade.

The Tunis postal authorities have organized a line of motor conveyances for the expedition of telegrams, parcels and passengers from Sousse to Sfax and Gabes, and have contracted with the private conveyance companies for a term of 12 years.

CORRESPONDENCE.

Improvements in Steam Cars.

Editor THE AUTOMOBILE:

My most remarkable experience in more than two years' operation of steam carriages was repairing a burned out boiler on the roadside. My greatest expense on these vehicles was the tires, which caused me more delay on my tours than any other part of the vehicle. Another bad feature of steam vehicles is the absence of a gauge on the fuel tank. This is important, as many insurance companies restrict the sale of this fuel in suburban districts after sunset. A serviceable chain-guard, to prevent the chain from slipping (as in most cases it becomes sprung), would be an improvement.

R. L.

BALTIMORE, MD.

A Down Hill Experience.

Editor THE AUTOMOBILE:

An experience of mine which was novel and exciting, to me at least, may prove interesting to other motorists. While ascending a hill in my steam runabout the steam ran down and the brake refused to work, the carriage started backward and ran down hill, swerving to one side, and on striking a rut turned completely over—with the result of a bruised head for my wife and a broken seat for the machine. I crawled out from under the wreck, extricated my wife, and righted the machine. We got some water from a neighboring farmhouse, hung the remains of the seat over the back end of the water tank, sat on top of the boiler and found our way home by the back streets. I soon repaired the seat and brake and on the fourth day after ascended the same hill safely. My wife says that any car which will stand such treatment must be all right. The machine is a Locomobile and we use it every day when the weather permits.

C. H. C.

CEDAR RAPIDS, IOWA.

A Summer Tour.

Editor THE AUTOMOBILE:

The following run was made in a Foster touring car, from Watertown, N. Y., to Syracuse, Rochester, Elmira, Binghamton, Scranton, Wilkesbarre, Mount Pocono, Water Gap, Allenhurst, Rumson Road from Red Bank to Summit, the Oranges and New York. I should class the roads from Watertown to the Water Gap: Five per cent. macadam, 10 per cent. good, 10 per cent. a disgrace to civilization, 50 per cent. average country roads, 25 per cent. poor country roads; from the Water Gap the roads were mostly good. The total mileage was 708, the actual running time averaging 8.90 miles. The gasoline consumption was one gallon to 6.43 miles. The only delay or annoyance was a loss of one hour through the working out of a pin

in the pump which was repaired. But one hour of rain on the whole trip, driving us for shelter to a deserted farmhouse. We were out of water and the pump to the well was broken, but the thunder storm gave us a good supply from the roof.

An amusing incident of the trip was on one day which we spent at the summer home of a friend; the bright little four-year-old boy of the house at night time could not remember our names and explained matters as follows: "Lord bless papa and mamma and—very deliberately—now, well, those two fellows that came here on that automobile. Amen;" then jumped into bed.

W. H. M.

WATERTOWN, N. Y.

Carburetor Gave Trouble.

Editor THE AUTOMOBILE:

I have on my machine a carburetor of home construction which is of rather large size and built on the very simple plan shown in the sectional illustration herewith. A friend of mine had a carburetor of slightly different shape, but of substantially the same construction and obtained satisfactory results with it. When first tested my carburetor did not seem to supply sufficient fuel, even though the needle valve was opened abnormally. After experimenting with it in various ways, just as a venture, I removed the uppermost screen, of the series below the needle valve. Since making that change the carburetor has acted well and has given absolutely no trouble.

CHARLES W. KING.

ELMIRA, N. Y.

Wrecked at High Speed.

Editor THE AUTOMOBILE:

We have sent you, under separate cover, a photo of our automobile after a wreck,

have accidents in the West as well as you have them in the East. There were two of us in the rig, going at the rate of about 25 miles an hour, when we struck a broken culvert. The rest was a blank until we landed 60 ft. from where we struck and recovered our senses. An eye witness said the machine went straight up in the air; at any rate, it jumped 30 ft. ahead and landed in the middle of the road bottom side up. The photo shows the machine after it had been picked up from the road. S. D. Breuning and H. Nazett were the occupants.

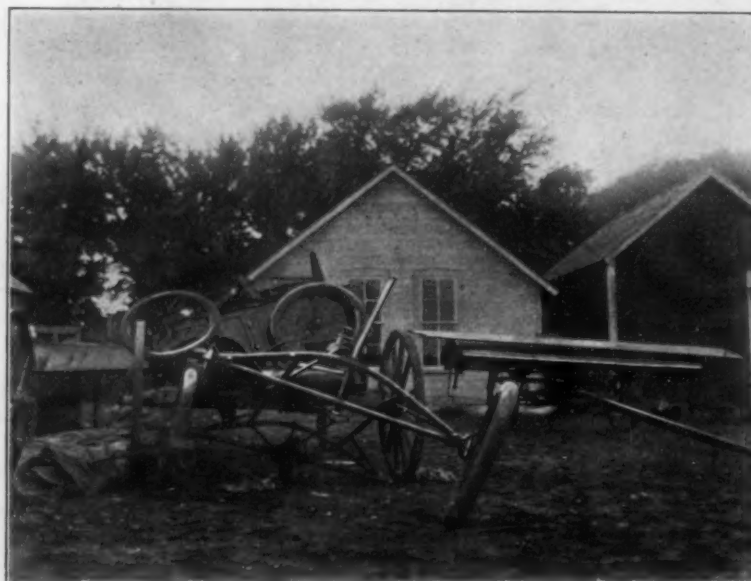
S. D. B.

ACKLEY, IOWA.

Effectuated Temporary Repairs.

Editor THE AUTOMOBILE:

Sometimes, if not always, a serious accident on the road may be adjusted by a surprisingly simple repair. As an instance of this I submit the accompanying drawing, which shows plainly how I repaired a broken steering gear in a very few seconds. The link connecting the two steering knuckles broke off sharply and as we were some distance from town it momentarily appeared that we were "up against it." There are, however, on this rod in my machine two depending arms which are used to prevent the steering wheels from being turned at an excessive angle, the arms striking against the side reaches of the underframe. These arms are secured to the rod by rather wide clamps whose ears are drawn together by heavy bolts. We simply loosened one of these arms, and, moving it from its correct position, clamped it directly across the break in the rod and drew the binding nut up as tightly as possible with a large wrench. Homeward bound we were careful not to give the steering gear any severe



RESULT OF A MIX UP IN AN IOWA CULVERT.

thinking that perhaps it might be of some interest to you. It goes to show that we

jolts and were gratified that the impromptu repair held it own. FRED. A. WELCH.

NEW YORK TO PITTSFIELD, MASS.

An Automobile Trip Through the Hudson River Valley to the Picturesque Berkshire Hills.

A trip from New York to Pittsfield, Mass., in a Toledo gasoline touring car, made by Messrs. Baker, Campbell and Hildebrand, is described in an interesting way by the latter. The party, accompanied by Mr. Baker's chauffeur, started out Friday afternoon, September 5, the route lying by way of Peekskill, Poughkeepsie, Hudson and Chatham, through the Hudson river valley.

"We encountered very rough roads between New York and Peekskill," writes Mr. Hildebrand. "On one of the hills



they were repairing the road and had piles of dirt and gravel deposited all over the road to a depth of 5 or 6 in. We got three-fourths the way up and the car stopped. We tried to start several times, and each time the car responded, but stopped again. The rear wheels would not take hold, but turned around. Some one suggested to turn around and take another route, to which I objected. We finally backed into a field, got a good start and she went through without any trouble.

"We reached Peekskill about 6 o'clock in the evening, having left the city about 2 P. M., a distance of 50 miles. We were not out to make any records, but to take our time and enjoy the trip, and to climb every hill, if possible, no matter what its condition. We put up at Peekskill over night and left on Saturday morning at 8:30 o'clock, after purchasing gasoline and oil and going over the car and adjusting things that were necessary, as the car was new and needed attention. When two miles out of Peekskill we got stuck on Indian Hill, which was covered with dust and the wheels could get no hold. We found that one of the spark plugs would not work, and upon taking it out and examining it we realized that we had too much oil in our cylinder, the plug was smeared and would not fire. After cleaning this off we went up without any trouble, and we were more careful after this.

"At Poughkeepsie we took dinner, and stopped there two hours. After leaving Poughkeepsie we struck some good roads

at times and traveled from 28 to 35 miles an hour; ordinary small grades we would rush up by simply advancing the spark lever. A short stop was made at Rhinebeck to take on water. Between Rhinebeck and Hudson we found a rock road that was in a horrible condition. Rocks as large as a hat were scattered over the road, and on each side were deep ruts. We were compelled to take the center of this, and at times we thought the engine body would strike. After this we came to dirt roads, with deep wheel ruts, but our car would follow the ruts because our steering gear had some play in it, and we got over this very nicely. We arrived at Hudson about 6:30 o'clock in the evening, after covering 80 miles, over some of the worst roads that I have ever traveled.

"We expected to finish the last 40 miles of our trip Sunday morning, but on getting up we found it was raining very hard. We looked the car over, filled the gasoline tanks, purchased some oil and tightened up a few nuts and bolts that needed



adjusting, and as the sun came out we left a little after 11 o'clock in the morning. The roads were very wet and we had to drive slow on account of the car slipping. It ran in the first and second speed continually. We were afraid we would not be able to climb hills under these conditions, but by switching from side to side and having the sprag out on every hill we managed to get up without any trouble. We did not get stuck on a single hill.

"At Chatham we were compelled to put in a new plug, as one had become so hot it would not work. This was caused by the very hard work the engine had to do driving the car over the heavy roads we encountered. This delay, however, was short. After leaving Chatham we encountered the Berkshire Hills and climbed some hills we never expected the car would go up, over rises, with "thank-you-ma'ams" every 30 to 40 ft. In crossing the mountain range we had a steady up grade of 3 1-2 miles. We used the first speed and

went the entire distance without missing fire once. The country around here is beautiful, one can see for miles and miles. After we reached the summit we had a wild coast down the other side, around short curves that would make one's blood tingle, and reached Pittsfield in time to catch the afternoon train back to New York.

"We enjoyed the trip of 170 miles very much, particularly in watching the dogs that were following us. In one instance a cur was rather bold and got too close to the front wheel and got nipped. He was turned over, and when he got up he did not know which way to run; when he got his bearing, however, he put on his high gear and disappeared."

The accompanying views are reproductions of snap shots taken by Mr. Hildebrand during the trip.

A. C. A. Route Cards.

The Automobile Club of America has issued two new route cards compiled from data furnished by President Albert R. Shattuck and Cortlandt F. Bishop. One of these is from New York to the Berkshire Hills (Pittsfield), and the other from the Hudson to the Connecticut rivers, through the Berkshire Hills. Both give the consecutive mileage and the intermediate distances between towns in columns at the left. These are followed by the names of the towns in black, with directions in smaller type beneath. The best hotels are also named. The club has



requested all members to supply similar information regarding other routes over which they have toured, to be made use of in the same way for the benefit of all the members who may wish to make trips.

A 200-mile pleasure run from Prairie City, Ill., to St. Louis, Mo., was made in two days recently by Dr. J. A. Matlock and Mrs. Matlock, of the former place. Deep sand was encountered between Alton and St. Louis. The runabout in which the trip was made was the first automobile ever taken into Prairie City, and was the first one ever seen in many of the towns through which the couple passed en route.



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BRITISH RELIABILITY TRIALS.

Coming just on the eve of the first event of the kind in this country, the report of the reliability trials of the Automobile Club of Great Britain and Ireland, which we publish this week, will be of more than ordinary interest. Prevented by law from indulging in the speed contests which have given so much prominence to the motor car on the Continent, British motorists have been forced to turn to a different sort of test for that public competition which now seems necessary to the full success of the industry. This, in itself, is anything but a misfortune, as it can hardly be disputed that, however great the advantages derived from such races as Paris-Berlin and Paris-Vienna, the results are indirect and sometimes misleading; and with speed as the sole end in view they can never meet the requirements of a true scientific test.

Tied down rigidly to a speed of 12 miles, British motorists have been unable to take up road racing and have been hampered in their attempts to substitute road tests at reasonable speeds; but they have persevered, each year showing a marked improvement in the conditions and the final results. In the present case the speed of 12 miles, enforced by ambuscades of overzealous police behind every hedge on certain routes, is so far below the economic power of any good car that the results are in no way as conclusive as they might be; but at the same time they are the most valuable yet obtained in any country.

The conditions in this country are midway between those in Great Britain and on the Continent; road races, while not directly prohibited by a national law, are made difficult or impossible by the condition of the roads; and for reasons of policy

the reliability test is to be preferred to the speed contest. The first important attempt at an endurance contest, the New York-Buffalo run of last September, proved but a crude experiment; being in part a wild race paced by a powerful French racing car, while the open rebuilding of the vehicles en route robbed it of all technical value. The conditions of the coming contest promise a much fairer test though, as more of an experiment, the trials may be in some respects inferior to the English ones. With the experience of the coming trials as a guide, and with a fairly liberal enforcement of the present speed laws, there will be no good reason why the reliability trial should not become of real technical value as well as interesting to both contestants and to motorists in general.

MATERIALS OF CONSTRUCTION

A short time ago, during conversation with an engineer who has achieved some distinction in another line and is now interesting himself in the construction of automobiles, the subject of the physical properties of American materials of construction was brought under discussion. The gentleman to whom we refer undertook, two or three years ago, to construct an exact copy of a well known French voiturette, then and since conspicuous for the lightness of its design and the nicety of its workmanship. The American builder's experiences in attempting to duplicate this car were instructive. He had abundance of means and skilled labor, and was not hampered by lack of ability to reproduce the ultra-refinements of workmanship necessitated by the design of the car, but the materials furnished him by American mills and foundries could not bear comparison with those used in the French car. He was obliged to double the thickness of the walls of the tubing from which the main frame was built. Aluminum alloys showing even nominal strength when cast were impossible to find. The search for steel castings which should be workable, homogeneous, and free from blow-holes, proved long and wearisome. One concern of the highest reputation seemed unable to produce castings for the case surrounding the differential (on the rear axle) which would not break in a particular spot; another concern "guaranteed" castings free from blow-holes, but when it came to the point, would not agree to make good work spent on faulty castings, for the simple reason that they could not afford to, blow-holes being, in fact, too numerous to justify such a policy. Even the bronze proved inferior to the productions used on the French car, and efforts to duplicate the French body springs only resulted in showing that the spring steel available on this side of the water was far inferior in elastic limit to the French product. The net result of all this was that our friend found it necessary, even

while retaining the French motor employed in the original car, to add nearly 50 per cent. to the weight of the rest of the machine before it would show reasonable durability.

It is a matter of common knowledge that substantially these same facts are true of most machines built in this country, and it is assuredly high time that those interested should set themselves to discover the reason and the remedy. It would be a mistake to infer, that because the American car above described had to be 50 per cent. heavier than the French machine of the same size and presumably equal durability, it follows that American materials of construction are 30 per cent. weaker than the French. Weight begets weight; and, after conceding the fact that the heavier machine would show a slightly less speed than the lighter, it is doubtless true that the American builder is compelled to demand a higher factor of safety throughout his construction than the French on account of the severe road conditions here met with. Nevertheless, after making all allowances, the facts are sufficiently serious.

We think that the explanation is to be found along several contributing lines. In the first place, America is peculiarly the home of industrial methods which produce in vast quantities articles which meet the average need, to the practical exclusion of products in which a slightly higher quality must be obtained by special processes whose cost is greater than the absolute percentage of gain in quality. Naturally a steel mill which produces material for rails, bridges and buildings by the thousands of tons is not likely to bother with rolling special sections of special grades of steel by the tens of tons for automobile builders, even for what would seem "fancy" prices. The price must be very much more artistic than the industrial education of Americans has led them to think of, and while the price, if paid, would certainly not need to be higher than abroad, the commoner grade of material is relatively so much cheaper that it is hard to persuade the general public that it is not better worth its price even in an automobile.

Naturally, we do not share the public's opinion. In a machine like the automobile, where every pound in the motor means another pound in the running gear, and the rapidly mounting weight counts heavily in the tire bill, hardly any price is too high to pay for lightness. We look to see a gradual appreciation of this fact among purchasers, and with this appreciation a growing demand which will justify the production of special materials in special shapes at prices which will compensate the makers. Already such materials, many of them, are available to the builders of torpedo boats; and while the automobile may properly use even higher grades and more refined workmanship,

still the advance in the art will be by no means small when the public has learned to demand torpedo boat materials in its machines.

On account of the amount of space occupied in this issue by the extensive reports of the Cleveland race meeting and the British reliability trials, we are compelled to omit the serial article on the Gasoline Vehicle. The series will be continued in future issues.

The Automobile Club of America has amended Rule VI of the Reliability Contest rules by striking out Class D, Motor Cycles, and all other provisions in relation thereto. The time for receiving entries for the event expires on Thursday, September 25.

ST. LOUIS AND DAYTON CLUBS

List of Officers of Two Prosperous Middle State Organizations.

Copies of the constitution and by-laws of the Automobile Club of St. Louis and of the Dayton Automobile Club have been received during the past week. The officers of the former club are as follows: President, G. H. Walker; vice-president, Dr. Jules F. Valle; treasurer, Edward Mallinckrodt, Jr., and treasurer, Dr. E. M. Senseney. The board of governors includes besides the foregoing officers, Horace Rumsey, George B. Leighton, A. W. Neidringhaus, John Ring, Jr., and John Carter. There are four committees, as follows: Membership, John Ring, Jr., chairman; J. J. Howard, L. G. McNair; House, John S. Carter, chairman; Walter McKittrick, George W. Hellmuth; Exhibitions, Runs, Tours and Contests, A. W. Neidringhaus, chairman; Horace Rumsey, E. H. Steedman; Laws and Ordinances, George B. Leighton, chairman; H. S. Turner, O. L. Halsey.

The officers of the Dayton Automobile Club are as follows: President, Carl L. Bauman; vice-president, Dr. A. F. Bowman; secretary-treasurer, Dr. W. Webster Ensey; road captain, Frank P. Hilt. There are four committees, as follows: Membership, Earl H. Kiser, chairman; Dr. G. W. Miller, Dr. A. F. Bowman; Exhibitions, Contests, Runs and Tours, Frank P. Hilt, chairman; Vincent G. Apple, Dr. A. C. Bonner, Edward Reynolds, J. D. Platt, Jr.; Laws and Ordinances, E. A. Hochwalt, chairman; John Kiser, Henry Coleman; Roads, E. Francis Platt, chairman; Harry Loy, John S. McIntire. The club now has thirty-nine members.

The American Brass Co., of Waterbury, Conn., has sold to a junk dealer the tube drawing machinery which it acquired when it absorbed the Mannesmann Tube Co., whose plant was located near North Adams, Mass. The equipment included sixteen Mannesmann machines, estimated to be worth nearly \$80,000.

GREAT DEMAND FOR SPACE AT THE NEW YORK SHOW.

WILL BE OPEN JANUARY 19 TO 24.

All of the Main Floor Space Has Been Allotted—Many Manufacturers of Complete Vehicles, Parts and Accessories Yet to Be Heard From—Overflow Will Occupy Restaurant, Gallery and Basement.

That the New York automobile show to be held during the week of January 17 to 24, 1903, will be the greatest exhibition of motor vehicles and appurtenances ever held in the United States is made manifest by the fact that, although the application blanks for space and the diagram of exhibition spaces in Madison Square Garden were sent out less than two weeks ago, all of the main floor space has already been allotted, and thirty-four of the fifty-eight spaces in the gallery have been rented. In some cases as many as four or five applications for the same spaces have been received on the same day. The management has allotted the spaces strictly by precedent, according to the rules, and in such cases has allowed the applicants to draw lots. There are a number of very prominent manufacturing concerns that have not yet come in, and there are several applications in the hands of the management that were received after the main floor spaces were all allotted.

There are 17,634 sq. ft. of exhibition space on this floor, and it is intended to add to this 4,000 additional square feet by providing exhibition spaces in the restaurant, where the loan exhibit was installed last winter, to be occupied by complete vehicle makers. It is expected that even this may prove inadequate, and that it may be necessary to place some of the exhibits of the lighter machines in the gallery, and even to turn the basement to a similar use. The basement has been painted in white and is well lighted by electric lamps.

The arrangement of the booths on the main floor has been changed from the first plan, making four instead of three longitudinal rows of booths, and providing an oval promenade outside of all the stands next to the wall of the gallery. By the new arrangement there are sixty-seven spaces on the main floor and fifty-eight in the gallery.

Announcements of the allotment of spaces were mailed to the exhibitors on Tuesday, September 23. The list of exhibitors so far provided for is as follows:

EXHIBITORS ON MAIN FLOOR.

Mobile Co. of America.....Tarrytown, N. Y.
Foster Automobile Mfg. Co.....Rochester, N. Y.
Peerless Mfg. Co.....Cleveland, Ohio.
Ohio Automobile Co.....Warren, Ohio.
C. J. Moore Co.....Westfield, Mass.
Loomis Automobile Co.....Westfield, Mass.
Meteor Engineering Co.....Reading, Pa.
Automotor Co.....Springfield, Mass.
Olds Motor Works.....Detroit, Mich.
International Motor Car Co.....Toledo, Ohio.
Pan-American Motor Co.....Mamaroneck, N. Y.
Knox Automobile Co.....Springfield, Mass.
Autocar Co.....Ardmore, Pa.

White Sewing Machine Co.....Cleveland, Ohio.
Smith & Mabley.....New York City.
Locomobile Co. of America.....New York City.
Baker Motor Vehicle Co.....Cleveland, Ohio.
Waltham Mfg. Co.....Waltham, Mass.
Geo. N. Pierce Co.....Buffalo, N. Y.
Vehicle Equipment Co.....Brooklyn, N. Y.
Studebaker Bros. Mfg. Co.....South Bend, Ind.
B. V. Covert & Co.....Lockport, N. Y.
Upton Mfg. Co.....New York City.
Crest Mfg. Co.....Cambridge, Mass.
Spaulding Automobile & Motor Co.....Buffalo, N. Y.
E. R. Thomas Motor Co.....Buffalo, N. Y.
Thos. B. Jeffery Co.....Kenosha, Wis.
Berg Automobile Co.....New York City.
Ward Leonard Electric Co.....Bronxville, N. Y.
Winton Motor Carriage Co.....Cleveland, Ohio.
Automobile Co. of America.....New York City.
Pope-Robinson Co.....Hyde Park, Mass.
Fournier-Searchmont Automobile Co.....Philadelphia.
J. Stevens Arms & Tool Co.....Chicopee Falls, Mass.

EXHIBITORS IN GALLERY.

Hartford Rubber Works Co.....Hartford, Conn.
Metallic Rubber Tire Co.....New York City.
Baldwin Chain Mfg. Co.....Worcester, Mass.
Badger Brass Mfg. Co.....Kenosha, Wis.
Jos. Dixon Crucible Co.....Jersey City, N. J.
B. F. Goodrich Co.....Akron, Ohio.
Veeder Mfg. Co.....Hartford, Conn.
Rose Mfg. Co.....Philadelphia, Pa.
Gray & Davis.....Amesbury, Mass.
R. E. Dietz Co.....New York City.
National Carbon Co.....Cleveland, Ohio.
Atwood Mfg. Co.....Amesbury, Mass.
Buffalo Gasoline Motor Co.....Buffalo, N. Y.
Standard Welding Co.....Cleveland, Ohio.
American Ball Bearing Co.....Cleveland, Ohio.
Whitney Mfg. Co.....Hartford, Conn.
Dow Portable Electric Co.....Boston, Mass.
Chas. E. Miller.....New York City.
Thos. J. Wetzel.....New York City.
Diamond Rubber Co.....Akron, Ohio.

Third Ascent of Mt. Greylock.

The third automobile to make a successful climb of Mt. Greylock in the Berkshires this season was driven up last Sunday by W. J. Gould, an agent for the sale of the Grout steam vehicle. Several weeks ago two Locomobiles were driven successfully to the summit of the mountain to the great astonishment of motorists, who regarded the climb of the mountain practically an impossibility. The recent work of the park association on the winding roads leading to the summit have made them passable for automobiles and by another season there will undoubtedly be many ascents made by New York people who summer in the Berkshires. The Grout machine which made the climb was 6-h.p., and weighed 1,300 lbs. It was the design to make a record run, but the roads were so muddy from recent rains that the time was not fast, although the ascent was made without difficulty. If the roads improve Mr. Gould will make another attempt for a speed record up the mountain this season.

Exports from New York.

Exports of motor vehicles and parts for the same from the port of New York for the week ended September 20, were as follows: Cuba, 1 pkg. motor vehicle parts, \$50; Liverpool, 2 pkgs. motor vehicles and parts, \$9,889; Mexico, 6 pkgs. motor vehicle and parts, \$442; New Zealand, 2 motor vehicles, \$1,500.

WASHINGTON WILL WITNESS AN AUTOMOBILE PARADE, DURING THE G. A. R. ENCAMPMENT

A Special Committee in Charge of the Arrangements Includes Many Members of the National Capital Automobile Club—Valuable Prizes Will Be Offered and Advertisements Barred.

WASHINGTON, D. C., Sept. 20. (Special Correspondence.)—Plans for the automobile parade, which is to be a prominent feature of the G. A. R. encampment entertainment early in October, are being perfected. A special committee to have charge of the event has been appointed and is composed of nearly a hundred men prominent in automobile circles of the National capital. The chairman of the committee is Senator John M. Thurston, of Nebraska, and the other officers of the committee are as follows; First vice-chairman, Robert B. Brown; second vice-chairman, C. E. Wood; secretary, E. H. Duff. Among the members of the committee are General Miles, president of the National Capital Automobile Club; F. C. Stevens, Clarence H. Norment, Hon. Davis Elkins, W. J. Foss, Col. Henry May, Dr. Ralph Jenkins, Dr. Fry, Dr. Flint, A. L. Cline, W. T. Headley, F. De B. Weston, John C. Wood, Captain Avery, and C. J. Bell. Nearly the entire membership of the National Capital Automobile Club is on the committee.

COURSE OF THE PARADE.

There are abundant assurances that the automobile parade will be one of the most spectacular events ever seen in Washington, a city famous for parades. The present arrangements provide that the vehicles shall start from the Congressional Library on Capitol Hill at 10 o'clock on the morning of October 6, and proceed through the Capitol Grounds to Pennsylvania Avenue, passing en route the White House, where the reviewing stand will be located and in which President Roosevelt, Admiral George Dewey, and other prominent men who will act as judges, will be stationed. The parade will disband north of Pennsylvania Avenue and Seventeenth Street.

Members of the Cabinet, the District officials and other prominent government officials will participate in the parade, and vehicles will be provided for them at the head of the line. General Bingham, assistant Secretary of Agriculture, has promised that a large electric carriage will be handsomely decorated with sheaves of grain and potted plants from the Agricultural Department. There will also be a number of large automobile omnibuses for the use of several bands, which will play during the progress of the parade. Senator Clark, of Montana, has informed the committee that if he cannot be in Washington on the day of the parade, he will see to it that his \$10,000 steam machine is in line.

Four prizes will be offered by the com-

mittee; two for the first and second best floral-decorated automobile, and the others for novelty features. The prizes will be silver loving cups, with appropriate inscriptions. No advertisement displays will be permitted in the parade.

The real success of the parade lies with the individual owners of automobiles and it is gratifying to the committee that they are coming forward with their entries and many have signified their intention of doing everything in their power to make the parade a signal success. While many of the motorists are still away, enough entries have already been secured to make a splendid showing, and as nearly all will have returned before the day of the parade, practically every automobile in Washington will be in line.

ENTERTAINMENT IN SPRINGFIELD.

Plans of Local Club to Amuse Participants in A. C. A. Reliability Run.

SPRINGFIELD, Mass., Sept. 22. (Special Correspondence.)—Plans for the entertainment of the participants in the 500-mile reliability run from New York to Boston under the auspices of the Automobile Club of America, are being developed by the Springfield Automobile Club to cover the two nights that the party will spend in this city. The contestants are expected to arrive here from New York on the afternoon of October 10, and are to pass up Main Street to the riding academy in Marble Street, where the machines will be housed for the night. The members of the party are to make their headquarters in the historic Massasoit House.

The local automobile club has arranged with Manager Casey for 200 of the most desirable seats in the Nelson Theater for Friday night and a specially attractive performance will be put on for the entertainment of the visitors. It is expected there will be a large number of automobilists here that day besides those taking part in the run, as manufacturers and owners of vehicles will come in from surrounding cities to see the different types of machines. Already the clubs in Pittsfield and Providence have signified their intention of sending delegations, and other clubs are planning to follow their lead. The Springfield club will give every person running an automobile a free ticket to the theater.

After the performance in the theater the party will adjourn for a social hour in the Massasoit House, where the local and visiting automobilists will have an opportunity of meeting those who are contestants in the reliability run. Further details in the entertainment program will be arranged at a future meeting of the local club, when committees on reception and other departments will be appointed.

The Daimler Co. has cleared a net profit of 378,407 marks on the last year's working and is paying a dividend of 5 per cent.

DETROIT RACES POSTPONED.

Now Set for September 29 and 30 Because of Rain—Detroit Club's Opening.

DETROIT, Mich., Sept. 20. (Staff Correspondence.)—The automobile races which were to have occurred here yesterday and to-day were postponed until September 29 and 30, on account of rain, but this did not deter the Detroit Automobile Club from adhering to its original plan of formally opening its new club rooms last night. Many of the visitors and prospective contestants remained in Detroit during the evening, and these forces, added to the local contingency, swelled the gathering at the function to a satisfactory size.

NEW CLUB HEADQUARTERS.

The new club headquarters are on the second floor of the automobile establishment recently erected by W. E. Metzger on Jefferson Avenue. The main room is tastily decorated and furnished in an antique style of black and red, and is commodious and comfortable. There is no buffet, but, following the plan of the A. C. A., each member is provided with a locker wherein such beverages as he desires may be kept.

Overland from Chicago.

CLEVELAND, O., Sept. 20. (Staff Correspondence.)—Among the out-of-town visitors at the Cleveland races last Tuesday was a party from Chicago, which came in a caravan comprised of five Winton touring cars. In one were Mr. and Mrs. C. H. Tucker and daughter, and Professor and Mrs. Leonide Keating, of Diamond Lake, Mich. The second contained Mr. and Mrs. J. F. Palmer and Dr. and Mrs. A. H. Bromback; Mr. and Mrs. W. W. Morrison, of Bryon, O.; Mr. and Mrs. E. E. Willett and Miss Mitchell occupied the third; Mr. and Mrs. Roy Hancock and Miss Freschel the fourth, and John Farson, Jr., and party the remaining one. The leaders left Chicago on Wednesday morning and worked steadily through the sandy roads of a Michigan route. The 122 miles between Toledo and Cleveland were covered on the last day, Monday.

Bids for Mail Wagons.

MILWAUKEE, Wis., Sept. 20. (Special Correspondence.)—Postmaster Stillman has been authorized to receive bids for transferring the mails to and from the postoffice and the depots, boat docks and substations, by automobiles instead of by horses and wagons, as at present, for a term of four years from July 1, 1903. A number of other Wisconsin cities will be supplied with automobile service if the prices are reasonable. At present the mail is transferred by nine "screen" wagons, in Milwaukee, but it is believed that motor wagons are better adapted for this service and that the work can be done faster than by the present system.

LAUNCH RACES AT MIDDLETOWN.

First Meeting, Though Held in a Rainstorm, was Largely Attended—Four Separate Classes.

MIDDLETOWN, Conn., Sept. 20. (Special Correspondence.)—The first power launch races of the Middletown Yacht Club were run to-day in spite of a driving rainstorm, with over 2,000 spectators. There were four classes: Red class, auxiliary boats; White class, 15 to 20 ft. water line; Blue class, 20 to 25 ft.; Green class, 25 to 30 ft. In all there were seventeen entries. The course was 4 miles down the Connecticut River and back. The prize winners, owners, prize and corrected time were: Red class, Quato, Arthur Williams, yacht ensign, 1:08:42; Kwasind, E. S. Miller, coil of rope, 1:11:13. White class, Ruth, Burt Hale, pair of spruce oars, 1:09:47; No. 9, Walter Markham, lantern, 1:10:41. Blue class, Chick, O. E. Stoddard, Cape Cod folding anchor, 50:05; Cricket, Mowry & Reed, picture, 51:56. Green class, Meda, Russell Frisbie, yachting watch, 56:55; Ramona, R. C. Monkham, ensign, 57:00. The prize for making the best time, a silver loving cup, was awarded to Chick. The 5 gals. of gasoline for the last boat home was given to Eaglet, Clarence Brockway, 1:20:02. The officials were: Rules committee, F. C. Becker; judges, Commodore George A. Coles, W. W. Wilcox, Jr., and E. A. Ely. Time keepers, Henry Woodward, Charles Coles and G. W. True. A lunch was served the yachtsmen by the club.

Long Launch Cruise.

SYRACUSE, N. Y., Sept. 15. (Special Correspondence.)—Mr. and Mrs. G. W. Boyce, of this city, have returned from the longest trip ever made in a small gasoline launch. They left Syracuse on July 17, went to New York by way of the Hudson River, then returned to Troy, passed through the Champlain Canal to Lake Champlain, from there proceeded to Montreal and Quebec, by way of the St. Lawrence, through the Thousand Islands and into Lake Ontario. The trip occupied six weeks and covered 1,463 1-2 miles. Late in June the launch, which is named the Jack, was taken for a preliminary week's trip in Oneida Lake. Counting that and some side trips, the boat has covered 2,000 miles. On the trip 550 gals. of gasoline were used. The Jack is 36 ft. long and 6 ft. wide. Negotiations are on for the sale of the craft to New York parties, in which case Mr. Boyce will build a 55-ft. launch for next summer's trip. He states that during the whole cruise the party were the recipients of many courtesies from yacht clubs. When on a passage the meals were cooked on board and except where a stay of a day or so was to be made the party slept on board. Considerable difficulty was met in obtaining gasoline in Canada and as high as 30 cents a gallon was paid for it there. Mr. Boyce says that the pay of the pilots was not as large as

might be expected. From Whitehall to Montreal the pay of the pilot, including his return expenses, was not over \$30. From Montreal to Ogdensburg the pilot received \$25, and from Ogdensburg to Alexandria Bay, \$10.

Notes from New Haven.

NEW HAVEN, Sept. 20. (Special Correspondence.)—It is stated that the Niantic Menhaden Oil & Guano Co., which has just been incorporated in this State to build and operate boats in the menhaden fishery, and which has a capital of \$50,000, will be the first to introduce gasoline motors into this fishery. It is believed that auxiliary craft in this class of fishing will be much cheaper than steam vessels, and much more quickly operated than sailing vessels. The innovation is one that will be watched with interest. All of the boats in the great menhaden trust are now operated by steam.

The auxiliary sloop Alice, F. C. Becker, is now at Noank, where a new Lathrop motor is being installed and new rigging fitted, in preparation for a southern cruise which may extend as far as Cuba. Capt. Adams, of West Haven, will start South next month in the new launch specially built for the purpose, making his second launch cruise to Florida. Marcia, sloop, has been sold by Dr. J. F. Axtelle, of Hartford, to R. E. Hagstaff, of Brooklyn, and Dr. Axtelle has purchased a 30-ft. cabin launch at Greenport. The launch is fitted with gasoline motors of 10 h.p.

Power for Water-Boats.

The old-time water boat, with its one big sail and powerful hand pump on deck, which was once a familiar sight in every harbor, seems doomed to disappear before the new competition of the gasoline craft. Where there was no profit in a trade of

both ice and water to the many yachts and coasting vessels which frequent the mouth of the Thames. The hand pump has been displaced by a power pump by which a vessel's tanks may be filled quickly. One of these boats followed the New York Yacht Club fleet last summer and of course did a good business; it is stated that a third is projected.

The Florida Fleet.

Charles Meloy, of New Haven, is building a 41-ft. launch at Bridgeport, Fla., and will put her into river trade there the coming winter. She will be fitted with a 9 1-2 h.p. Lathrop engine, with brass work and reversible wheel from the Foster works here.

The new 40-ft. launch which Captain Geo. E. Adams will take out to Florida this fall will have a double Lathrop engine of 15 h.p., with a Foster wheel.

A 28-ft. sharpie from the South Quinipiac Street Works, is being completed with a 6-h.p. Palmer engine, and is to be shipped to Jacksonville by steamer from New York.

Buffalo Marine Motors.

The Buffalo Gasoline Motor Co., of Buffalo, N. Y., has just issued a new catalogue and price list of its marine motors. These are high-speed motors of the four-cycle type, running at 700 to 1,500 revolutions for the smaller and 700 to 1,000 for the larger sizes. The smallest size, 4 h.p., is a two-cylinder motor, but all the larger, up to 25 h.p., have four cylinders. The time-shaft is placed at the top of the motor, close to the valve ports, and is driven by helical and bevel gears through an intermediate vertical shaft. A new arrangement of prices is adopted, each motor being catalogued with a full list of accompanying parts and appurtenances, the price



WATER BOAT LIZZIE PETTIGROVE OF NEW LONDON.

this kind with a steamer, a good business is found for the gasoline craft, cheaply run with a small crew and able to make her way in spite of calm and tide. The above cut shows one of these new boats, the Lizzie Pettigrove, of New London; she and another similar craft now serve

quoted being for the complete outfit ready for installation. Twelve different "outfits" are given, from the simple 4-h.p. motor with battery and a few tools, up to the 24-h.p. motor with all necessary parts. The pamphlet is well illustrated and gives a good idea of the motors.

BINGHAMTON AUTOMOBILE RACE.

Thirty-Two Vehicles in Line in City's First Event—
Formed in Historical Order.

BINGHAMTON, N. Y., Sept. 20. (Special Correspondence.)—Promptly at 4 P. M., to-day, Binghamton's "400" started in thirty-two vehicles in the first automobile parade held in this city. The procession was headed by four red Locomobile touring cars operated by their owners, John A. Gale, D. A. Smith, Fire Chief Faatz and E. G. Freeman. Following these came two large Wintons and half a dozen Pierce motorettes. The second section was led by Thomas Noyes in his first car, a Hertel, which arrived in Binghamton in March, 1899. The remaining machines were in order of their arrival in town, so that the parade partook of an historical character. In this section was also an exhibit of the home made automobile. Among the most skilful of the operators was Miss Ward, who ran the huge car of C. H. Ward in a way that rivaled the most adept in the parade. Invited guests filled the vehicles, and surreys and tonneaus were provided for members of the city press. The streets were lined with spectators and the prospects of the early formation of a local automobile club appear to be excellent.

Other participants in the parade who drove their own machines, besides those named, were: A. W. Clinton, Geo. H. Nelson, D. J. Nash, Fred G. Jones, John Cutler, J. K. Noyes, H. W. Edison, Louis R. Clinton, R. W. Whipple, Perry Heroy, H. E. Shear, C. F. Hotchkiss, C. H. Watkins, and T. W. Whipple, all in Locomobiles; W. E. Kent, Waverley electric; Clinton Collier and W. E. Corby, in Wintons; Dr. F. L. Forker, Norman Pierce, Frank Root, Dudley Greene, and M. J. Teeple, in Pierce motorettes; F. W. Sears, Knox; W. E. Bundy, Buffalo; C. C. Wiley, Orient; Willis Sharp Kilmer, Panhard.

SPEED ORDINANCE VETOED.

Mayor of Racine Holds that Six Miles is Unreasonably Slow for Automobiles.

RACINE, Wis., Sept. 20. (Special Correspondence.)—Mayor Michael Higgins has vetoed the ordinance which the common council passed some time ago, limiting the speed of motor vehicles to six miles an hour in the city, which is not much faster than a brisk walk.

The mayor, in returning the ordinance to the council unsigned, write: "In my opinion this is too slow a rate of speed to be reasonable when applied to vehicles such as you propose to regulate. In my opinion automobiles or bicycles can be safely run on our streets at the rate of at least 8 miles per hour without any great liability to accidents or injury resulting therefrom. Because I believe that the rate of six miles per hour to be an unreasonably slow rate of speed for automobiles

and motor cycles, I hereby veto the ordinance and recommend that an ordinance of similar regulations be passed, wherein the rate of speed be not less than 8 miles per hour."

The council will not pass over the veto. It has seen that its action in passing the ordinance was unreasonable to the motorists of Racine, of which there is a large and growing number.

BALTIMORE GASOLINE ORDINANCE.

Measure Introduced in Council Will Seriously Affect Motorists if it Should Pass.

BALTIMORE, Md., Sept. 20. (Special Correspondence.)—An anti-gasoline ordinance was introduced by Mr. Parker at the last meeting of the city council, and referred to the committee on fire department. A meeting of the special committee on gasoline, of which Mr. Parker is chairman, was called for Monday afternoon to consider the ordinance. The measure repeals and re-enacts, with amendments, Sections 72 and 73 of Article 20 of the Code of 1893, and the text of it is as follows:

Section 1. Be it ordained, That naphtha, benzine and gasoline shall not be kept on storage in quantities exceeding at any one time one barrel of standard size and similar in all respects to barrels required for the use of illuminating oils or fluids, in any one place, whether it be a store, or warehouse, or private dwelling, or other building of any kind whatsoever. Nor shall any of said articles, to wit, naphtha, benzine or gasoline, be bought or sold by any person or persons or corporation in quantities less than one barrel of standard size and of the kind as aforesaid.

Sec. 2. Be it further ordained, That the sale or use of what is ordinarily known as a gasoline stove in any private dwelling, store or building of any kind, for domestic household purposes, by any person or persons or body corporate, be and the same is hereby strictly prohibited.

Sec. 3. Be it further ordained, That from and after the passage of this ordinance naphtha, benzine and gasoline shall not be kept in any quantity whatever in metallic packages, either for sale or use for any purpose whatever, by any person or persons or body corporate.

Sec. 4. Be it further ordained, That any person or persons or body corporate who shall violate any of the provisions of this ordinance shall be deemed guilty of a misdemeanor, and upon conviction shall be fined \$100, or be confined in jail not more than 90 days, in the judgment of the court.

Sec. 5. Be it ordained, That this ordinance shall take effect from the date of its passage.

The enactment of the proposed ordinance will work a great hardship on users of motor vehicles, who must of necessity buy gasoline in less than barrel quantities should their tanks become empty when the machine is some distance from the storage station or from their own home. And, by the text of the first section, the keeper of a storage station is prohibited from selling the motorist a tank full of the essential liquid fuel. The third section is so broad that it can be construed to prohibit the use of gasoline in vehicles at all times, unless wood or earthen tanks are substituted for the metal tanks now in use. It is hoped that a reasonable modification of the ordinance will be agreed upon by the Council.

MOTORING IN WORCESTER.

Number of Private Vehicles Has Increased 100 Per Cent in Two Years.

WORCESTER, Mass., Sept. 20. (Special Correspondence.)—The growth of motoring in this city during the last two years has been remarkable; in fact, the trade here has exceeded by far that in other cities of equal size. Two years ago only ten or twelve automobiles were owned here, whereas now there are between 200 and 300 private machines in addition to those owned by the three local public stations. Each of these stations is fully equipped with the latest appliances for repairing machines and with conveniences for storing them. They own from fifteen to twenty vehicles each and each employs from ten to a dozen workmen.

Gasoline machines predominate, with the Knoxmobile and Oldsmobile as particular favorites, and the Winton also popular. The White is well liked and much used in the steam class. Few French vehicles are owned here.

Prominent motorists and local dealers predict that in three or four years the public cabs, delivery wagons, ice carts, etc., will be power vehicles. Of late several business men who live in adjoining towns and come to business in Worcester, have adopted the automobile as a means of regular transportation, instead of depending upon the electric cars or driving horses. In addition to being faster than the other modes of travel, it is more comfortable and exclusive than the crowded trolley car, and possesses the advantage over the horse that it can be stabled in the morning and taken out in the evening without requiring any attention in the meantime, as it does not have to be fed, watered or blanketed.

BRITISH ARMY EXPERIMENTS.

Report of Committee on Heavy Vehicle Trials Recommends Internal Combustion Motor.

The official report of the committee in charge of the trials of heavy vehicles instituted by the British War Office in December last has just made its report, the general conclusions being as follows:

"The trials have shown that these steam lorries are good and serviceable machines suitable for present supply, and likely to be of great advantage to the transport service in countries where fuel and water in sufficient quantity is available. The committee, however, desire to call attention to the great possibilities for military purposes of the internal combustion lorry burning heavy oil, as shown by the small fuel consumption and practical independence of water of the one which was tried, belonging to George F. Milnes & Co., Ltd. The committee strongly recommends that steps to develop such lorries be proceeded with.

"Compared with horse-draught, these trials have shown that self-propelled lorries can transport five tons of stores at about six miles an hour over very considerable distances on hilly, average English roads under winter conditions. The load transported by each single lorry (five tons), if carried in horse wagons of service pattern would overload three G.S. wagons, requiring

twelve draught horses, besides riding horses, whose pace would not ordinarily exceed three miles an hour. Moreover, the marching of 197 miles in six consecutive days over hilly roads would not have been accomplished by horses even at that speed without the assistance of spare horses.

"The committee are of opinion that it has been demonstrated that mechanical transport of this nature has many advantages, and that it is well worth a much more extended trial.

"Regarding the type of lorry, the experience gained at these trials has caused the committee to somewhat modify their original views. On more than one occasion the disadvantage of the trailer in preventing the lorry from moving freely backwards when required was clearly noticeable. On the whole the committee consider that a lorry drawing a single wagon, while having the disadvantages accruing from the use of a trailer, does not obtain, owing to there being only one of these vehicles, the full advantages which should belong to the system, and they consider that for handy and rapid work of distribution among troops and near the front of an army a lorry without trailer is preferable. At the same time they consider that for the heavier work of moving stores in large quantities to the depots a powerful tractor drawing a train of wagons behind it, will be found most suitable.

"The committee therefore recommend that they be empowered to take steps to obtain for trial a lorry or lorries on the following lines:

"To carry three tons, driven by an internal combustion engine burning heavy oil only; weight as light as consistent with due adhesion; wheels large and broad, and fitted with a means for rapidly applying numerous 'spuds' for use on boggy ground. Speed up to eight miles an hour; large platform area.

"Finally, the committee beg to call special attention to the demonstration afforded by these trials of the entire harmlessness to roads of vehicles considerably exceeding in weight and road-speed the limits allowed by the present regulations on the subject, and also fitted with wheels to which road strips have been fixed, so long as these wheels are of large diameter and have tires of considerable width. It has now been proved that the existing regulations are unnecessarily restrictive, whilst they stand in the way of the development of a most important method of transport and branch of industry.

"The committee strongly recommend that this matter be brought to the notice of the proper authorities, feeling confident that the removal of these restrictions will tend to assimilate the commercial and military types of vehicles, and is not only important therefore from a service point of view, but also will have a most beneficial effect on the manufacturing industries of the country and its commercial development generally.

New Grand Rapids Co.

Capital has been subscribed for a new company to be organized in Grand Rapids, Mich., for the production of gasoline vehicles after designs of a vehicle on which Clark Sintz has been working for some time in Grand Rapids, and which is now practically completed. A test is to be made this week as a final preliminary to the organization and incorporation of the company. The test is to be a daylight run in 15 hours from Grand Rapids to Detroit, a distance of about 200 miles, on the successful outcome of which depends the payment of the subscriptions. Among those who will be identified with the new company are Clark Sintz, Charles Matheson and Louis C. Howard, Mr. Matheson subscribing the larger part of the stock capital.

INDUSTRIAL NEWS FROM OUR OWN CORRESPONDENTS.

RECEIVERS FOR A. C. MFG. CO.,

Appointed Upon the Application of Creditors in Milwaukee and Baltimore—Counsel Says Company is Solvent and Is Simply Short of Ready Cash—Changes in Agencies in San Francisco—Winton Plant Moving.

CHICAGO, Ill., Sept. 20. (Special Correspondence.)—The American Cycle Mfg. Co. was this week placed in the hands of R. L. Coleman, A. A. Pope and John A. Miller, as receivers, by order of Judge Jenkins, of Milwaukee. The application was made by Attorney Henry S. Towle, representing the American Wood Rim Co., of Charlestown, W. Va., and Fred J. Stimson, of New York, complainants. Mr. Towle explained that the company had lost credit through the appointment of receivers for the American Bicycle Co., and that its business might be placed in jeopardy at any time if the creditors should become impatient and secure judgments against it. He stated that the corporation is solvent but has little cash on hand. The company operates four large factories here.

BALTIMORE, Md., Sept. 20. (Special Correspondence.)—Judge Goff, of the United States Court, to-day appointed R. Lindsay Coleman, Albert A. Pope, and John A. Miller, of Newark, receivers for the American Cycle Mfg. Co. The suit was brought by Frederick J. Stimson, of New York, and the American Wood Rim Co., of Bradford, Pa., and Charlestown, W. Va. It is alleged that the bicycle company owes the wood rim company \$2,026.51.

Golden Gate Notes.

SAN FRANCISCO, Cal., Sept. 17. (Special Correspondence.)—Manager Lazelare, of the local Mobile agency, has been succeeded by Frank E. Hartigan, who arrived from New York, where he was formerly connected with Mobile agencies. Mr. Lazelare says he will soon be connected with a new company of local business men of wealth and prominence.

Walter Grothe, formerly assistant to Rollin H. White, at Cleveland, O., and a son of the general superintendent of the White factory, has arrived to take charge of the mechanical work at the Pacific Coast branch for the White Sewing Machine Co., which is under the general management of C. A. Hawkins.

Manager E. P. Brinegar, of the Locomobile Co., of the Pacific, left last week for a tour of inspection of his sub-agencies.

Moving the Winton Plant.

CLEVELAND, O., Sept. 20. (Special Correspondence.)—By October 1, only five months from the time that ground was broken for the erection of the big model plant of the Winton Motor Carriage Co.,

on the Lake Shore Railroad and West Madison Avenue, the new plant will be in full operation on the Winton vehicles for 1903. All of the buildings are practically completed now and the company has for two weeks been transferring machinery and tools from the old Brush plant on Belden Street, on the East Side, to the new factories on the West Side, operating both simultaneously and losing not an hour's time in the work of vehicle production. The machines were transferred one at a time, the workmen engaged in operating them going with each, taking their tools with them, setting up the machine in the new factory and resuming work as soon as it was installed. Not until the old building has been practically deserted will the work cease there, although every day the amount of it decreases. The new plant consists of three buildings, the largest containing the woodwork, trimming and painting departments and also the company's offices. The forge and foundry are in another detached structure, while the repair machine shop occupies a third large building.

Receiver for Niagara Company.

BUFFALO, N. Y., Sept. 20. (Special Correspondence.)—D. W. Sowers was yesterday appointed receiver in voluntary dissolution of the Niagara Motor Vehicle Co., by Justice White. The hearing is set for January 25, before Referee John Lord O'Brien, as the time and place for interested parties to show cause why the corporation should not be dissolved.

The Niagara Motor Vehicle Co., having offices at 121 Grant St., filed certificate of incorporation in the office of the county clerk in the first week of December, 1901. Its authorized capital stock was \$25,000. The officers of the company were Robert S. Weed, president; William L. Slater, treasurer and secretary; and Charles A. Lindstrom, superintendent. Mr. Lindstrom was formerly connected with Hewett & Lindstrom, in Chicago, manufacturers of electric vehicles. The Niagara company made electric runabouts called the Niagara.

The initial trip of a fifteen-passenger motor stage that is to make regular trips between Mullica Hill, Wenonah, Glassboro and Clayton, in Gloucester County, Pa., was made recently by the Mobile Transportation Co.

Receiver for Hydra Battery Co.

Thomas L. Raymond was last week appointed receiver for the Hydra Double Battery Co., which has offices at 72 Reade St., New York, and has been manufacturing semi-dry batteries under German patents, in a plant at 24 to 27 West St., New York, which burned down last July. The company is a New Jersey corporation, with an authorized capital stock of \$1,000,000. The receiver furnished a bond for

\$8,000, the appointment was confirmed by Vice Chancellor Emery at Newark on the 18th, and Mr. Raymond took charge of the company's office in New York. In the schedule filed by Edward & William T. Day, counsel representing some of the creditors, the liabilities are placed at \$62,000, and the assets at \$4,000. It is believed, however, that the value of the assets will increase in the receiver's hands. Allen S. Apgar is president of the company, while Lieut.-Gov. Timothy L. Woodruff, of New York, is one of the directors. The company has been hard at work of late in fitting up a new and complete factory, which was almost ready for occupancy and was also getting out a new catalogue.

TRADE BREVITIES.

A branch station is to be opened at 134 West Thirty-eighth St., New York, by Homan & Schulz, New York agents for the Northern runabout.

Secretary E. E. Britton, of the Berg Automobile Co., states that sixteen vehicles will be displayed by his company at the Madison Square Garden automobile show this winter.

The announcement is made that the Badger Brass Works, of Kenosha, Wis., will discontinue the manufacture of plumbers' supplies and make only automobile and carriage lamps.

New Jersey capitalists are reported to be considering the feasibility of establishing an automobile stage line from Freehold to the seashore, over a private roadway to be built by the company.

Henry L. Trebert, of Syracuse, N. Y., has started the manufacture of gasoline engines and transmission gears at Rochester. He was formerly superintendent of the Stearns Steam Carriage Co.

An exhibition of motor vehicles, bicycles, typewriters and other mechanical goods, open to manufacturers and inventors of all nations, is to be held in the Crystal Palace at Leipzig from October 18 to 26.

A complete Darracq motor has been mounted on an iron stand in the show room of the American Darracq Automobile Co., 652 Hudson St., New York, and is used for explaining to customers the construction and operation.

Henry Nyberg, of Kenosha, Wis., has secured a patent on a flexible shaft for motor vehicle propulsion. He has three other applications pending, the most important of them being for an engine for automobiles which is said to be noiseless.

If manufacturers of automobiles and motor cycles will send prices, weights, measurements, and other information to United States Consular Agent W. D. Gordon, at Johannesburg, South Africa, he will place the information in the hands of interested parties.

One of the finest motor vehicle livery and repositories in the Northwest is being erected for the Great Western Cycle Co., of Minneapolis.

The Atlantic City and Pleasantville Land Co., of Atlantic City, N. J., has been incorporated with \$50,000 capital stock, to deal in land, buildings and machinery, to run electric car lines and to manufacture motor vehicles of all kinds.

It is expected in Greenfield, Mass., that certain parts of the C. G. V. gasoline tonneau that are being made in the plant of the Rome Locomotive Works will be made in the old plant of the Oakman Vehicle Co., in Greenfield, now owned by the T. Morey & Son Printing Co. The Charon, Girardot & Voigt Co. was interested in the plant by Charles H. Keith.

An International Fire Exhibition is to be held at Earl's Court, London, from May to October, 1903. Every effort is to be made to secure a complete exhibition covering every article relating to the subject. The exhibits in class 11 (Fire Fighting) include motor fire engines, extinguishers, lamps and searchlights and all sorts of apparatus used in fighting fire. The London Exhibitions, Limited, will provide floor space at the rate of 97 cents a square foot, with a minimum charge of \$194, and exhibitors will incur no further expense beyond portage of exhibits and the equipment of their stands.

Syracuse Trade Brevities.

The foundation for the new automobile factory of the H. H. Franklin Co. has been laid and work is being rushed. This will be the most up-to-date plant in the city, every appliance for heating and power being of the most modern pattern. At the head of the company is Alexander T. Brown, inventor of the Smith type-writer. The vehicles that have been sold have given much satisfaction.

Officers of the Syracuse Fire Department have been investigating and have decided to buy a steam machine for the use of Chief John P. Quigley. With Chief Croker, of New York, the first, he will be the second in the country to ride to fires in an automobile. One machine will be purchased first and others later for the assistant chiefs, if the venture proves a success.

The Brown-Lipe Gear Co. has arranged with Thomas J. Wetzel to travel for it in states east of the Ohio line as direct factory salesman. He will maintain an office at 50 Warren St., New York City. He also handles the Timken roller bearing axles, and the Midgley steel wheels.

The Stearns Steam Carriage Co. will enter a touring car in the New York-Boston contest and will have an exhibit at the New York show. Some new models will be shown there. Superintendent William Sweet will run the car in the contest.

BUSINESS NOTES.

VICTORIA FOR DUCHESS OF MARLBORO.—An electric Victoria, purchased by the Duchess of Marlboro, through the Newport agency of the Electric Vehicle Co., of Hartford, Conn., was shipped to England last week by the manufacturers. The vehicle is of the regular Columbia Victoria type, and it is stated that the Duchess will operate the machine herself over the roads in the vicinity of Blenheim Castle, the seat of the Duke of Marlboro.

REDUCED PRICES ON MARSH MOTOR CYCLES.—As a result of economic methods of manufacture of motor bicycles in large quantities by the use of improved automatic machinery, and of economic sales management, the Motor Cycle Mfg. Co., of Brockton, Mass., manufacturer of the Marsh motor cycle, is offering these machines at prices reduced below its previous retail figures and allows a liberal discount from these to the dealer. The company is also offering at reduced prices a motor a little more powerful than its single bicycle motor to be built onto second-hand tandems. The complete outfit ready for attachment to the tandem is also quoted lower than the old list price, with discounts to dealers.

MILWAUKEE PARTS PURCHASED.—A large quantity of the material owned by the Milwaukee Automobile Co., which failed during the past summer, has been bought by the P. J. Dasey Co., 19 La Salle St., Chicago, and is now being offered at attractive prices to the trade in lots of twenty-five or more. Smaller orders will be filled at an advance in price of 50 per cent. These parts were made for the well-known Milwaukee steam vehicles and consist of all the various forgings and castings, rods, gears, hubs, levers, etc., used in those carriages. There are eighty bevel gear differentials complete without sprockets for 11-4-in. shaft, and twenty-five differentials with 30-tooth sprockets for 15-16-in. chain. Most of the parts are forgings, and are carefully machined. The Dasey company, in addition to the foregoing, is offering eight Brecht running gears, and has just issued circulars describing three styles of engines which it is ready to deliver. These are gasoline motors having mechanically operated exhaust, with cylinder and head water jacketed and having the transmission gearing mounted directly on the crankshaft in the framework in which the engine is mounted. The transmission is of the planetary system and gives two speeds, forward and reverse.

CRUCIBLE STEEL CASTINGS.—Castings of crucible steel that can be forged, tempered and welded are made by the Tool Steel Casting Co., of Chelsea, Mass. To enable users of steel castings to judge of the merits of its product, the company offers to furnish at its foundry or its Boston office (90 Canal St.) free of cost, or will send by express, if desired, a cast diamond point lathe tool, tempered and ready for use, as a sample of its high carbon crucible tool steel. An intelligent idea of the character of this cast steel and its value for other purposes can be obtained by forging the square end, making any kind of point desired, and tempering as with Jessop's tool steel. This will give a forged tool at one end while leaving the other just as it came from the sand, except for the grinding and tempering. This grade of crucible steel is particularly adapted for dies, drop forging dies, cutting knives for heavy shears, punches, cams, cold chisels, and for any purpose for which castings that can be tempered are needed. The company's soft crucible steel castings, especially adapted for automobile work, gears, crankshafts and parts of machinery in general and for all work that requires great strength and reduced weight, can be forged, welded and case hardened but cannot be tempered. The company also makes a specialty of this steel in castings for socket wrenches or other pieces that are difficult to drop forge. Rush orders can usually be filled in a few days.

REPAIR FACILITIES.—The Cedar Rapids Supply Co., of Cedar Rapids, Ia., is prepared to store and repair automobiles and to charge electrical vehicles. Its station is equipped to charge four machines at once.

NEW TOLEDO FOLDER.—"The Story of a Toledo by Telegraph" is the title of a 6-page folder issued by the International Motor Car Co. In it are reproduced fourteen telegrams reporting the progress of a Toledo steam carriage from Toledo to New York.

SALEM REPAIR STATION.—Zina Goodell has opened a new automobile repair shop at 2 to 8 Dodge St., and 84 Lafayette St., Salem, Mass. It is equipped with special machinery and vehicles will be built to order as well as repaired. There is storage space on the ground floor for vehicles, with a pit and other conveniences. The station occupies a floor space of 14,000 sq. ft., and experienced workmen are employed.

NORTHWESTERN STORAGE BATTERIES.—The Northwestern Storage Battery Co., of Chicago, is now located in a new plant at 465 West Twenty-second St., which is thoroughly equipped with modern machinery for the manufacture of its product. The facilities are such that it can fill orders promptly. This company makes chemically formed and Faure type plate batteries for use in motor vehicles, electric launches, decorative and train lighting, for central electric car stations and for all small low tension service. J. R. McMillan, who organized the General Storage Battery Co. two years ago, is at the head of the concern.

ROYAL BRAND LEATHER COATS.—A special leather coat for automobile use, called the Boston design, has just been placed in the market by J. C. Gillman & Co., well-known coat manufacturers of Boston, Mass. This coat is made of imported leather, cured and tanned by a secret process and finished in oil, giving it the genuine oil finish and making it soft, pliable and waterproof. The coat is made of large pieces and with as few seams as possible. The lining is of flannel, making the coat warm and durable without being bulky. There are three pockets on the outside, and a 51-2-in. collar and wrist straps. The coat is patterned after the latest French style. It is made in all sizes and will be sent on approval by the makers.

GASOLINE ENGINE CASTINGS.—Complete sets of castings for automobile and stationary hydrocarbon engines are being offered to the trade by the Bean-Chamberlin Mfg. Co., of Hudson, Mich. Among others, it supplies double cylinder castings with head, cylinder, valve chamber and water jacket cast in one piece. This arrangement saves time in machining and also eliminates all trouble from leakage and with packing blowing out at the head. There is only one connection to make, and that is between the upper and lower crank chamber. This, together with all other work, including boring the cylinder, can be done on an ordinary lathe, while the flywheels can be machined on a 22-in. lathe; or the company will sell them already machined at a slight additional cost. Complete instructions and full description are supplied by the makers.

TOLEDO LITERATURE.—The International Motor Car Co., of Toledo, has recently issued a 12-page catalogue in which is briefly described the new 16-h.p. Toledo gasoline touring car, illustrated by three excellent half-tones showing front and side views of the machine, with and without the detachable tonneau seats, and by top and side plan drawings showing the details of construction. Another new piece of literature is a 4-page folder illustrating and describing the new kerosene burner that the company now supplies without extra cost on the Toledo steam carriage, and also furnishes for attachment to the boilers of other steam vehicles. The same circular gives prices of the Toledo boiler compound, for which the company is prepared to take orders, that will counteract the scale-forming properties of water and also remove scale already formed in the boiler.

DIAMOND CHAINS

LARGE AND HARD
NICKEL STEEL RIVETS

GREAT TENSILE STRENGTH
AND ACCURACY

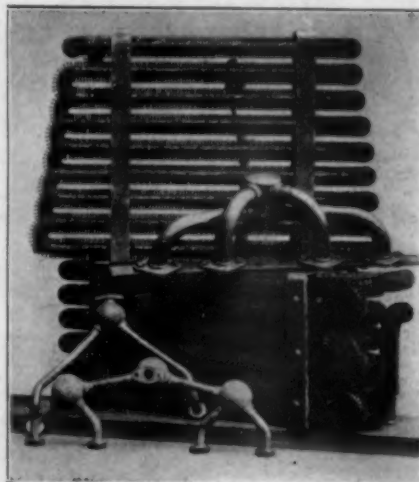


AVOID TROUBLE BY EQUIPPING MACHINES
WITH LARGE CHAINS

FEDERAL MANUFACTURING COMPANY
DIAMOND CHAIN FACTORY
Indianapolis - Indiana

Tube Bending and Bending Machinery

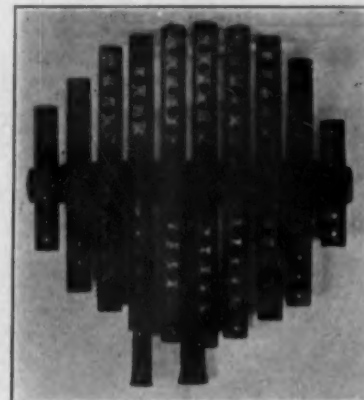
The accompanying photograph shows two styles of radiating coils made for its customers by the Tube Bending Machine Co., 10 Gouverneur St., New York. The lower coil is the style made for the Pan-American Co. (The Bostwick-McGregor enterprise at Mamaroneck, N. Y.). The tube bends also shown in the photograph are intake tubes and circulating pump connections for the same company. The tubes in the coils are bent on a machine that preserves the interior diameter of the tubes on the bends. The tube bending machines on which they were formed are made by the Tube Bending Machine Co., which also makes pipe coils and bends of every description. The preservation of the full round diameter of tubes at the bends is an important point, as it preserves the full efficiency of the



tube, avoiding the reduction of area at the bend which occurs when the pipe assumes oval form. Besides this, the retention of the circular form adds to the symmetrical appearance of the mechanism. The coils shown in the illustration are of 3-4-in. copper tube with 11-2-in. corrugated copper discs.

The New Piper Burner.

The accompanying illustration from a photograph shows a new burner that is being manufactured by the Waltham Automobile Co., of Waltham, Mass. It is made of a series of tubes, the number depending upon the size of the



burner, placed in horizontal position and bolted at right angles to a larger tube. The large tube is the mixing or receiving tube. The smaller ones are detachable from it so that any tube can be replaced with a new one. The tubes are each 1 in. in diameter, and there is a series of 5-16-in. tubes running through them at right angles to properly distribute the right proportion of gas and air. One of the larger tubes is used as the pilot light, and can be placed wherever desired. The burner is constructed so as to allow a free circulation of air between the tubes at all times, and as the tubes are not fastened at either end, the metal can expand and contract without any possibility of injury from warping or of cracking. The even distribution of the air and gas insures perfect combustion. This new burner, which can be used in any steam carriage and occupies the same amount of space as the usual burner, is called the Piper, after James W. Piper, the inventor, to whom patent No. 90,974 has just been granted.

STORAGE, REPAIR AND SUPPLY STATIONS

CONNECTICUT

SPEED—Outside city limits, 15 m.; inside, 12 m.; reduce at crossings; penalty for violation, not more than \$200. **HORNS or GONGS**—Not required by letter of law. **LAMPS**—Required on all rubber-tired vehicles; must be lighted from 1 hour after sunset to 1 hour before sunrise; penalty, \$5. If lights go out, operator "may proceed at 6 m. and give audible signal as often as 600 ft. are passed over."

HARTFORD

304 ALLYN ST. Phone 219-2
S. A. Miner. Phone Will Bring Our Repair Car Anywhere. Storing, Repairing, Charging, Gasoline. Always open.

43 WELLS ST. Phone 165
Hartford Automobile Station. Open day and night. Storing, Repairing, Charging, All Supplies.

NEW HAVEN

SPEED, ETC.—See state law. **PARKS**—Not allowed in some. **HORNS or BELLS**—Not required by letter of law.

DIST. OF COLUMBIA

WASHINGTON

SPEED—Outside city limits, 15 m.; off car-line streets, 12 m.; on intersecting car-line streets, 6 m. **LICENSE**—Required; fee, \$3; penalty, for operating steam vehicles without permit, \$1 to \$40.

1124 CONN. AVE., N.W. Phone Main 3027.
The National Capital Automobile Co. Agents for the Oldsmobile, Autocar and Packard. Storage, Repair and Supply Station.

ILLINOIS

CHICAGO

SPEED—Everywhere in town, 8 m. **BELLS**—Required, to be sounded at street crossings, etc. **WHISTLES and HORNS**—Prohibited. **LAMPS**—Required; must be lighted between dusk and dawn. **LICENSE**—Operators required to have license; fee, first year, \$5; thereafter, \$1. **NUMBERS or INITIALS**—Not required. **BRAKES**—Two sets required, one independent of driving gear. **SPECIAL**—No machinery may be left running when vehicle is standing in street with no one in charge.

5311-13 COTTAGE GROVE AVE. Phone Drexel 9363
C. A. Coey & Co., Agents for Woodruff Automobiles. Storing, Repairing, Renting and Supplies.

4 CALHOUN PLACE, near Dearborn. Tel. Central 4334
A. J. Millman. Storing, Repairing, Remodeling and Supplies.

285 N. STATE STREET. Telephone North 1430
Chicago Automobile Repository Co. Storage, Repairing, Remodeling and Supplies.

365 E. SUPERIOR STREET, Rear. Tel. North 1522
North Division Auto. Co. Automobiles Sold, Repaired, Charged and Stored.

12 PLYMOUTH PLACE. Phone Jackson 393
S. S. Williams. Special Machine Work. Gasoline Engines, Automobile Repairing.

VAN BUREN and OAKLEY BLVD. Phone West 252
Hagmann & Hammerly. Storage, Repairing, Remodeling. Agents Remington.

IOWA

CEDAR RAPIDS

CEDAR RAPIDS SUPPLY CO.

J. C. Pickering, Pres. and Treas. General Storage and Supply Station. Agents for Rambler Gasoline, Toledo Steam and Waverly Electric Machines.

MASSACHUSETTS

SPEED—Outside city limits, five district or thickly settled part of a town, 15 m.; inside such limits, 10 m.; approaching horses, reduce speed if animal shows fright and stop on signal of driver; reduce at crossings. **PENALTY**—Fine not exceeding \$200, or imprisonment not exceeding 10 days, or both.

BOSTON

SPEED—In city streets, 10 m.; in parks, 8 m.; outside city, 15 m. **LAMPS**—Three required. **PARKS**—Permit required from Park Department.

43 AND 45 COLUMBUS AVENUE
G. T. Gould, Boston Agency for the U. S. Long Distance Car.

147-153 COLUMBUS AVENUE
Columbus Automobile Exchange—A. J. Coburn & Co. Automobiles and Motor Cycles. Sole Agents for Orient, Elmore, Crestmobile, French Darracq Cars.

147-153 COLUMBUS AVENUE. Phone 388-2 Tremont
Columbus Automobile Exchange, New England Agents for Steam and Gasoline Automobiles. Storage, Repairing, Supplies.

Entrances Clarendon & Stanhope Sts. Tel. 251-9 Trem't
Back Bay Hydro-Carbon Repair Co. Gasoline Car Repairing a Specialty. All Work Done by Experts. First-class Storage Station.

66-68 STANHOPE STREET. Telephone 211 Tremont
Automobile Headquarters. Eastern Agts. for Knox, St. Louis, Gasmobile, Stearns, Pierce Motorettes. Also French and American Touring Cars. Open night and day the year 'round.

TREMONT and BERKLEY STS. Phone 1097 Tremont
Boston Salesrooms, Odd Fellows Building. "White Steamers." Stanhopes, Phaetons and Touring Cars. First-class Storage and Repair Stations.

CAMBRIDGE

424 MASS. AVE. Phone 142 Cambridge
Crest Mfg. Co. Repairing, All Supplies. Expert Mechanics and Electricians Furnished. Makers of Crestmobile; \$600. Crest Gasoline Motors, Colls and Parts.

8-10 PALMER STREET. 72-2 Cambridge
Harvard Automobile Co. Storing, Charging, Repairing, Building. Always Open.

SALEM

COR. DODGE AND LAFAYETTE near Depot.
Phone—Day, 438-4; Night, 106-4.
Repairing, Storing, Gasoline. All Supplies. Zina Goodell Mfg. Auto Parts and Machines to Order.

SPRINGFIELD

SPEED—State law applies. Reduce at street intersections. **LAMPS**—Required 1 h. after sunset; not enforced. **ALARM**—Required to be sounded as necessary. **PARKS**—Permit required for Forest Park; furnished free; rules accompany permit. No registration.

36-38 DWIGHT ST. Phone 869-12
Automobile Headquarters. J. E. Cowan, Mgr. Storing, Repairing, Charging, Supplies.

TAUNTON

4-5 POST-OFFICE SQUARE. Phone 209-3
Repairing, Gasoline, Water and Supplies. Robertson Auto Station.

WALTHAM

136 NEWTON ST. Phone 255-3 Waltham
Repairing, Storing, Gasoline, Supplies. Waltham Automobile Co. Mfg. of Piper Burners and Steam Automobiles.

WORCESTER

SPEED—10 m. **GONG or HORN**—Required. State law applies.

43 FOSTER, corner COMMERCIAL. Phone 559-4
Worcester Automobile Station, No. 1, Agents for Packard, Oldsmobile, Autocar and Rambler. Storing, Charging, Repairing, Supplies. Always open.

671-673 MAIN ST. Phone 1550
Robinson Automobile Station, Agents for U. S. Long Distance, White, Locomobile, Waverley. Storing, Charging, Repairing, Supplies.

MICHIGAN

DETROIT

265-267-269 JEFFERSON AVE.
W. E. Metzger, Agent for Waverley, Columbia, Baker, Olds, Toledo, Winton, Mobile and Geneva. Repairing and Charging Station.

NEW JERSEY

ATLANTIC CITY

1003 ATLANTIC AVE. Phone, Local 677, L-Distance 63A
J. C. W. Parsons, Agent for Locomobile and Electric Automobiles. Storing, Repairing, Gasoline and Supplies. Open always.

12 SO. MARYLAND AVE. Phone 544X Bell
H. W. Cochran, Agent for Electric Vehicle Co. Charging, Storing, Repairing, Gasoline, Supplies.

NEWARK

SPEED—In Newark, 8 m.; outside Newark, in Essex County, 15 m.; rounding corners, 4 m. **HORN or BELL**—Required to be sounded 100 ft. from other vehicles. **LAMPS**—One required, to be lighted 1 hour after sunset. **LICENSE**—Required; fee, 50 cents. **INITIALS**—Required on vehicle.

MECHANIC STREET, 27. Phone 3071 Newark
W. B. Dodge, Agent Electric Vehicle Co. Charging, Repairing, Storing and Supplies.

PATERSON

SPEED—No regulation. **HORNS or GONGS**—Some alarm required. **LAMPS**—Required between sunset and sunrise.

450 BROADWAY. Telephone 243
F. W. Stockbridge, Automobile Headquarters. Agent for Imported French Darracqs, Oldsmobiles, U. S. Long Distance, Prescotts, Locomobiles, Waverleys. Storing, Charging, Repairing and Supplies.

NEW YORK

COCKS LAW—**SPEED**—Outside corporate limits, 20 m.; on bridges, 4 m.; inside corporate limits, 8 m.; except where higher speed is permitted by local ordinance. **PENALTY**—A fine not exceeding \$50, or imprisonment not exceeding 6 mos., or both. **HIGHWAY LAW** (Doughty)

—**SPEED**—Outside built-up parts of towns and villages, 15 m.; in built-up sections of towns, 8 m. Must stop on signal of driver to let relative horses pass. **REGISTRATION**—Owner must obtain certificate from Secretary of State within 10 days after purchasing vehicle; fee, \$1. **INITIALS**—Required to be fixed to back of vehicle and must be 3 ins. high and 1/4 in. wide. **LAMPS**—Two required showing white light in front; also red light visible behind; must be lighted between from 1 hour after sunset to 1 hour before sunrise. **BELL or HORN**—One or other required. **BRAKES**—Required to be good and efficient; penalty, fine not exceeding \$25. **LOCAL ORDINANCES**—The state road law prohibits local town and park boards from excluding automobiles and bicycles from open public highways; from placing lower speed limits than 8 m. and 15 m. in unbuild-up parts of towns, and from requiring license or permit except from owners of public vehicles.

ALBANY

SPEED, LIGHTS, ALARM, INITIALS, ETC.—State law applies. **BRIDGE TOLL**—Single seat, 10 cents; double seat, 15 cents.

97-99-101 CENTRAL AVENUE. Phone 1509F L. Dis.
Automobile Storage & Trading Co., General Agency for Automobiles. Storage, Supplies, Repairs. Competent Attendants.

167 NORTH PEARL STREET. Long Distance 967
Albany Automobile Works. Motor Vehicles of all Types Stored and Repaired. Machine Shop Attached. Charges Moderate.

255 SHERMAN STREET. Phone 257F West
C. F. Weeber Mfg. Works. The Largest and Best Equipped Automobile Repair Shop in the city. Mfr. of Weeber Muffler.

AMSTERDAM

8 DIVISION ST. Bell Phone 260
Gode & Brown. Agents for Locomobile and Motor Cycles. Storage, Cleaning, Supplies. Up-to-date Repair Shop. Always Open.

BROOKLYN

712 BEDFORD AVE. Phone 537 Williamsburg
Lincoln C. Cocheu. Charging, Storage, Repairs. Batteries a specialty.

752 BEDFORD AVE. Phone 2356A Williamsburg
J. W. Mears, Exclusive Agency U. S. Long Distance Car. Automobiles Stored, Repaired, Sold and Exchanged.

1148 BEDFORD AVE. Telephone 2422 Bedford
Arthur R. Townsend. Agent for the Waverly Electric, Toledo Steam, Toledo Gasoline Car, Knox Gasmobile. Charging, Storing, Repairing, Supplies.

10 CLINTON ST., near Bridge. Phone 1225 Main
Maltby Mfg. Co., Agents for Moblie, Olds, National Electric. Storage, Repairs, Batteries Charged, All Supplies.

342 FLATBUSH AVE., near Eighth. Phone 1681 Main
International Motor Car Co. Charging, Storage, Repairing, Supplies. Open day and night.

473 FLATBUSH AVE. Phone 618 Flatbush Ave. Alex Schwalbach. Agent for All Popular Makes. Motor Cycles and Their Repairs a Specialty. Practical Repairer of Gasoline Automobiles. Carriage Tires Repaired and Replaced. Bicycles. Long Island Agent for the Racycle.

1239-43 FULTON ST., nr Bedford Av. Phone Bedford 705 Brooklyn Automobile Co., Agents Haynes-Apperson, Oldsmobile, Locomobile. Charging, Repairing, Supplies.

1241 FULTON ST. Phone 705 Bedford Chas. W. Spurr, Jr., exclusive agent for Brooklyn and Long Island for Crestmobile. Price \$600. Call and take a ride.

3 PROSPECT PARK WEST. Phone 969 Prospect Prospect Park Storage Co., Agents National Electric. Charging, Repairing, Storing, Supplies.

58 SCHERMERHORN ST. Phone 3710 Main Patterson & Shaw, Agents Elmore, Gasmobile, Waverley. Storage, Repairing, Charging, Supplies.

BUFFALO

SPEED—8 m.; on Main Street, south of Chip-pewa, 5 m.; rounding corners and at street and alley intersections, 5 m. HORNS or GONGS—Not required. LIGHTS—Required all hours after nightfall. REGISTRATION, etc.—State law applies.

873-875 MAIN ST. Phone 468 Tupper The W. C. Jaynes Automobile Co. Storage, Charging and Repairing Station. Complete line of Automobile Sundries. Agent for Oldsmobile, Winton, National Electric and Buffalo Electric Vehicle Co.

NEW YORK CITY

SPEED, LAMPS, BELLS, LICENSE—See state laws. FERRIES—Will carry any class of vehicle with tanks filled if engine is stopped and fire extinguished; toll, same as for teams. BRIDGE TOLL—Same as for teams.

17th STREET, 91 FIFTH AVE. Phone 6640-18th St. International Motor Car Co. N. Y. Salesroom Toledo Steam and Gasoline and Waverley Electric. Storage, Charging and Repairing.

37th STREET, 515 7th AVE. Tels. 6495&6496-38th Smith & Mabley, Importers of Panhard's, C. G. V., Renault Automobiles, Parts and Supplies. The American C. G. V. Gasoline Cars. Storage and Charging Station. Open Day and Night. Specially Equipped for Repair of Foreign Cars.

38th ST. 136 WEST. Phone 476 38th St. Standard Automobile Co. Sole U. S. Agents for the Deauville French Car. Also American Gasoline Cars. Thoroughly Equipped Repair Shop. Employing Only Skilled Mechanics. Parts, Replacements, Supplies and Storage.

38th ST. 138 WEST. Phone 6684 38th St. The Oldsmobile Co. New York Agents Oldsmobile Gasoline Runabouts.

43d, 38-40 WEST. Telephone 691-38th. A. G. Spalding & Bros., Agents for the Automobiles, Oldsmobiles and Waverley Electric. Charging, Repairing, Storing, Supplies. Open Day and Night.

43d ST. 50 WEST. Telephone 2289-38th Banker Bros. Co., Agents for Peerless Gasoline Cars, Pierce Motorettes and De Dion Parts. Storage, Repairs, Charging and Supplies. Open Day and Night.

44th ST. 307 WEST. Tel. 6486B 38th St. Long Acre Auto Depot. Storing, Repairing, Supplies. Second Hand Machines Bought and Sold.

44th ST. 523 FIFTH AVE. Tel. 6029 38th St. Westchester Auto. Co. Agents for Leading French and American Automobiles. Storage, Repairs, Supplies, etc.

50th ST. 239 WEST. Tel. 902 Columbus Alexander Fisher. The Georges, Richard, Mercedes, Rochet-Schneider.

51st STREET, 143 WEST. Phone 1601 Columbus Knickerbocker Automobile Station, S. O. Minter, Mgr. Storage, Charging, Repairing and Supplies.

53d STREET, 1684 BROADWAY. Phone 2397 Col. Central Automobile Co. Sole U. S. Agents for Peugeot, Mors, Cottareau. N. Y. City Agents Electric Vehicle Co., of Hartford. Charging, Storing, Repairing. Parts for French Vehicles. All Kinds of Supplies. Open Day and Night.

57th STREET, 140 EAST. Phone 1161 38th St. John Wanamaker. Fournier-Searchmont, Baker, Mobile. Charging, Storing, Repairing and Supplies. Open Day and Night.

57th ST. 154 EAST. Phone 3473-38th St. Metropolitan Motor Car Co. Expert Repairs for All Makes of Vehicles. Charging and Supplies.

58th STREET, 33-39 EAST. Phone 762-38th Barry & Hayes. Storage of Foreign Machines a Specialty. Repairs and Supplies.

58th ST. 150-152 EAST. Telephone 4421-38th St. Winton Motor Carriage Co., Branch House. Storage and Repairs for Wintons Only.

59th ST. 306 WEST. Telephone 2060 Columbus A. Elliott Ranne, Agent for Remington, Prescott, Darracq, Waverley and Toledo. Storage and Supplies.

59th ST. WEST, 317-319. Telephone 623 Columbus Adams-McMurtry Co., Agents for Packard Gasoline Cars. Repairing, Supplies.

60th STREET, 10 WEST. Phone 1874 Col. Webster Auto. Co. Agents Webster Gasoline Tonneau Car, Prescott Steam Carriages. All Makes of New and Second Hand Carriages Purchased, Exchanged and Sold. Storage, Repairs and Supplies.

60th STREET, 38-40 WEST. Phone 2440 Columbus American Storage Co. for Automobiles. Five Floors and Basement. Storage, Charging, Repairing and Supplies. Special Facilities for Taking Care of Foreign Machines and Oldsmobiles. Open Day and Night.

66th ST. 57 WEST. Tel. 1271 Columbus St. Nicholas Automobile Depot. Storage, Charging, Repairing and Supplies. Open Day and Night.

80th ST. 250 WEST. Phone 2562 Riverside Pa-delford & Bell, Agents for Columbia Electric Automobiles. Salesroom, Storing, Repairing, Supplies.

86th ST. 205-207-209 EAST. Tel. 3269-79th St. Yorkville Auto. Station. Exceptional Storing Facilities. Repairing and Supplies.

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COLUMBUS

SPEED—Off of business streets, 14 m.; on business streets, 8 m. PENALTY—Fine from \$5 to \$50 or 30 days imprisonment. BELLS or HORNS—One or other required, to be sounded when necessary. LAMPS—Required after dark. PENALTY—Fine not exceeding \$50.

TOLEDO

SPEED—Inside city limits, 10 m.

CINCINNATI

SPEED—In streets and parks, 8 m. HORNS or GONGS—Must be sounded 100 ft. before street crossings. LAMPS—Must be lighted between sunset and sunrise. BRAKES—Efficient brakes required. LICENSE—None required. INITIALS—None required. TOLLS—Bridge toll, 10 cents. SPECIAL—Two vehicles must not travel abreast.

PENNSYLVANIA

PHILADELPHIA

SPEED—Inside city limits, 7 m. Parks, same. BELLS or GONGS—To be sounded only at crossings. LAMPS—Required. PARKS—State law limits speed to 7 m. LICENSE—Required in parks; fee, 25 cents. NUMBERS—Must be attached at rear of vehicle in parks. TOLLS—No bridge tolls, but main roads have toll gates each 2 or 3 m.; charge same as for 2-horse team. FERRY—Charge same as for 2-horse team.

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SPEED—In city streets, 12 m.

5909 CENTER AVE. Phone 1664 East Pittsburg Automobile Co. Repairing, Charging, Storage and Supplies.

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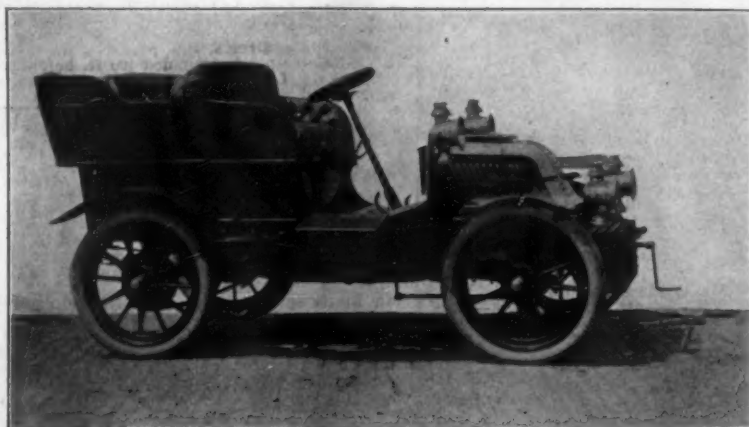
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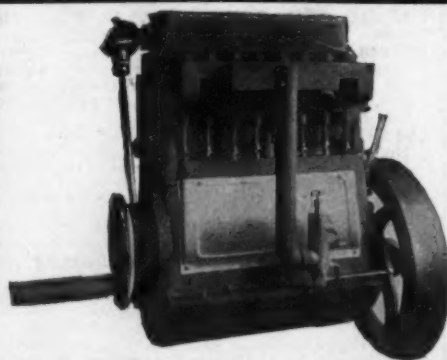
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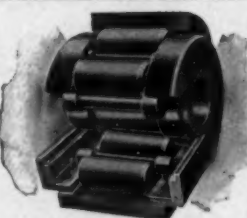
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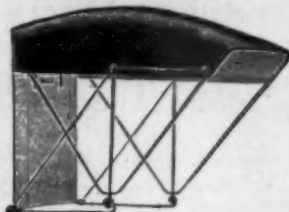
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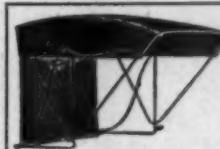
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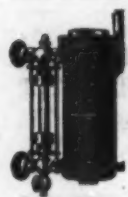
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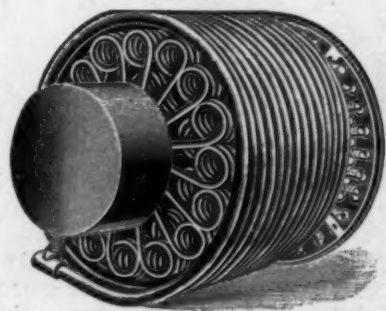
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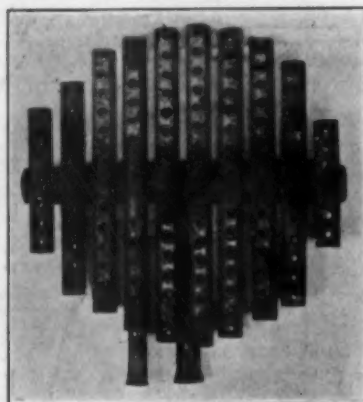
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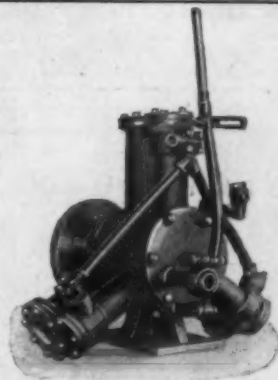
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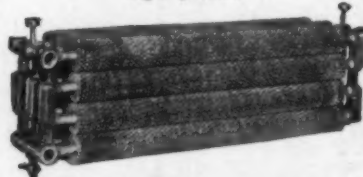
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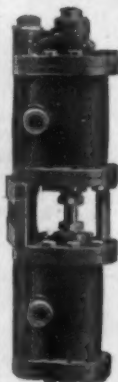
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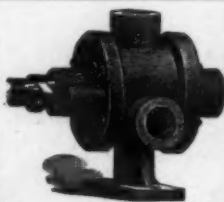
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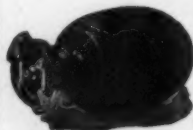
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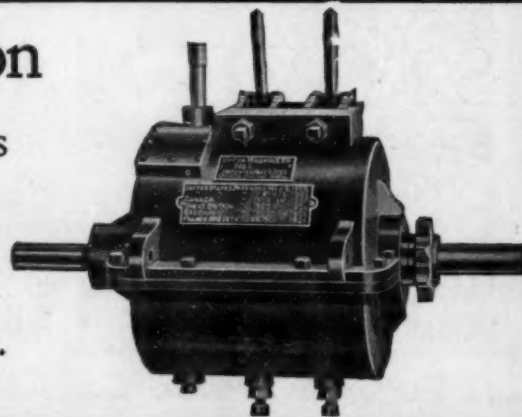
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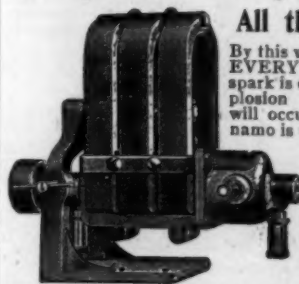
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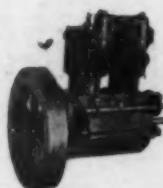
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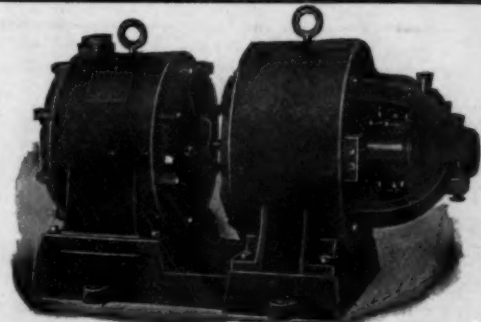
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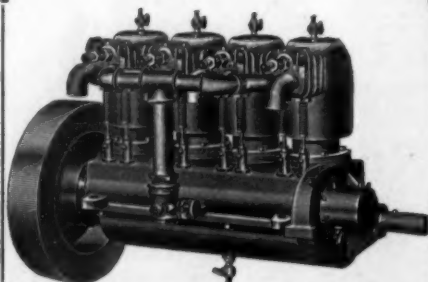
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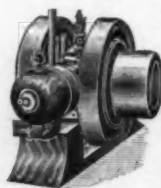
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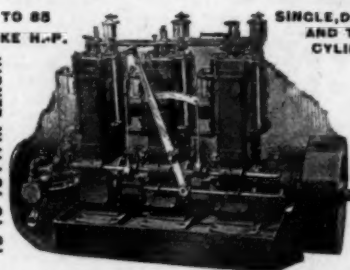


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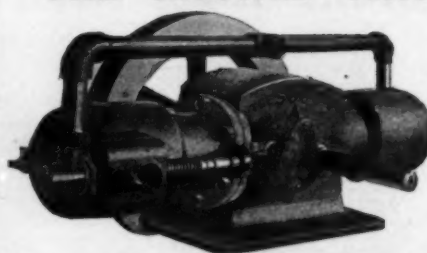
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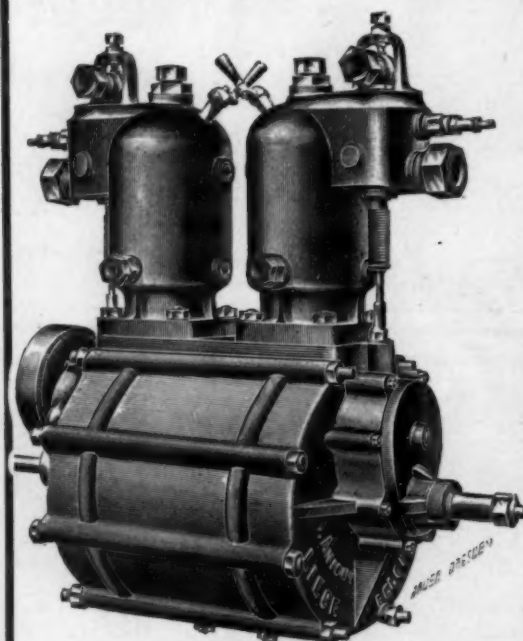
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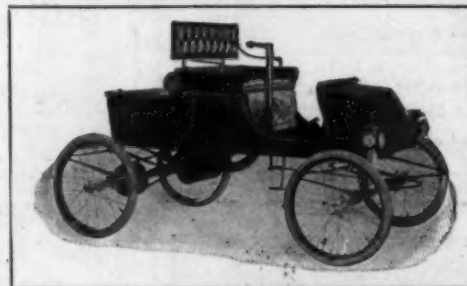
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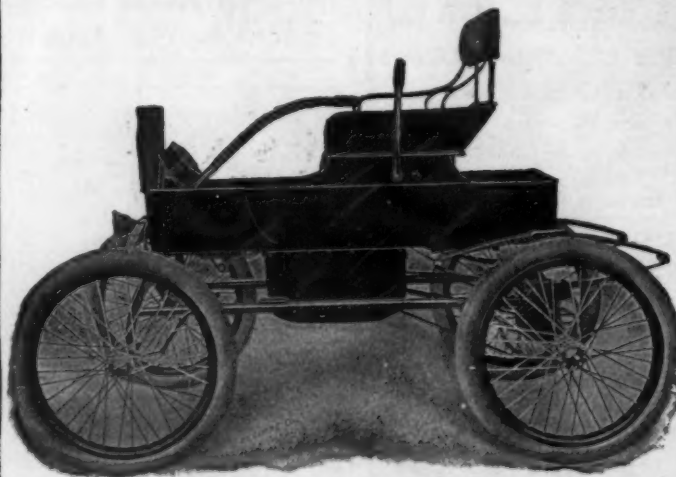
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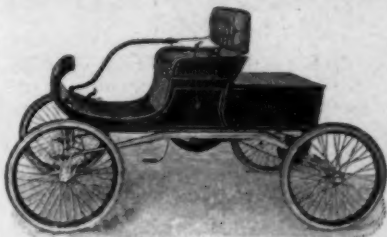
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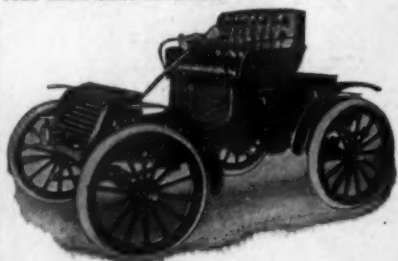
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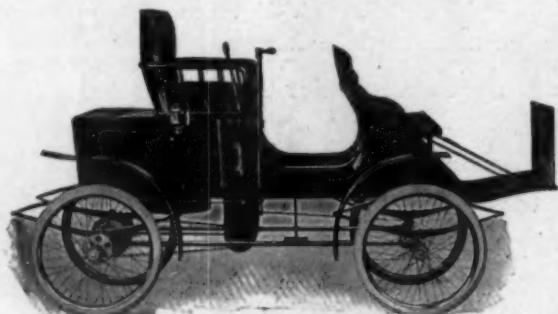
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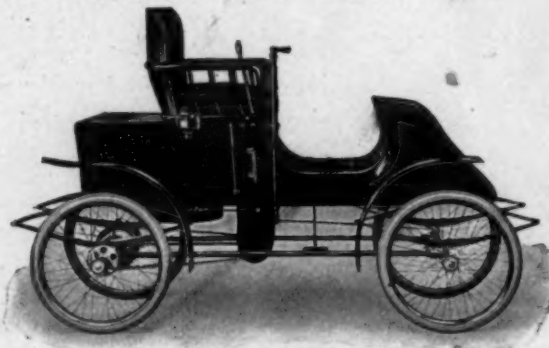
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